PROCEEDINGS

OF THE

MADRAS GOVERNMENT

IN THE

PUBLIC WORKS DEPARTMENT,

IRRIGATION BRANCH,

FOR

THE MONTH OF DECEMBER 1879.

Printed by Authority.

MADRAS:
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1879.

PUBLIC WORKS DEPARTMENT.

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IRRIGATION,

FOR THE MONTH OF DECEMBER 1879.

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IRRIGATION DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT,

FOR THE MONTH OF DECEMBER 1879.

Irrigation.

Read the following papers :—

No. 1. Proceedings of the Government of Madras in the Revenue Department, dated 13th September 1879, No. 1,878.

Endorsement of the Joint Secretary to Government, Public Works Department, Irrigation Branch, dated 9th September 1879, No. 299.

MEMORANDUM.

[Artesian Wells—G.O., R.D., No. 1,426, 7th July 1879.]

In order that the results obtained by the sinking of an artesian well in the Jardin d'Acclimatation at Pondicherry may be the more readily understood, it will be desirable to reduce the figures given in M. Carriol's report to the usual English notation.

The greatest discharge from the well recorded is ...	per minute	666	litres
equivalent to	do.	23·52	cubic feet
do. to	per second	0·392	do.

This quantity of water is sufficient for the irrigation of 25·87 acres, taking 66 acres as the duty of a cubic foot, a tolerably fair average. In Coimbatore and elsewhere, where water for irrigation is used without any attempt at economy, it would irrigate about half this area. In the Godávari Delta, where the works are fairly complete, about 29 acres would be capable of being supplied.

	FRANCS.
2. The cost of the well was, exclusive of certain appliances, which could be used elsewhere	5,050·12
Adding one-fifth of the cost of the appliances for wear and tear and setting up	514·11
Cost of well for *works* only ...	5,564·23

	RS.
The equivalent of this amount at two francs a rupee is	2,782
Adding establishment, &c., charges at 30 per cent. ...	834
Total cost ...	3,616

	ACRES.
3. For ordinary irrigation it may be assumed that the water from such a well would be utilised for eight months out of the twelve, and that two crops would be obtained, making the total irrigation of the year...	51·74
	RS.
The cost of the water-supply per acre would then be very nearly	70

To obtain 5 per cent. on this sum the water-rate per acre would have to average for the two crops $3·5 + 0·35^* = 3·85$ rupees an acre, and as ordinarily the water-rate for the second crop is about half that on the first, the rates would be $4\frac{2}{3}$ and $2\frac{1}{3}$ rupees, respectively. These rates are higher than are usual in Southern India.

* 10 per cent. on Revenue to cover repairs.

4. As a guide to an opinion it may be stated that the cost of the water-supply for irrigation in the Godávari Delta was up to the end of 1878-79 about	14·18 Rs. an acre.
Also that the expected ultimate cost of irrigation in the Kistna Delta is	30 ,, ,,

These figures include drainage, navigation, &c.

5. Whether or no the particular well at Pondicherry, of which a detailed account has been given, should be taken from a financial point of view as an average, a favorable, or an unfavorable example, there are no data available to show. The results of artesian wells must in the case of littoral formations be attended, it is thought, with a good deal of uncertainty, but assuming that a water-supply equal to that obtained in the Jardin d'Acclimatation could be secured anywhere near the coast for the same money, the cost is too high to admit of the general application of the system to ordinary irrigation.

6. Ordinary irrigation however is not the only purpose for which water is required.

The French well produces 146·58 gallons a minute,
or 211,075 gallons a day.

(1) Such a well would therefore supply a population of, say, 10,500 with 20 gallons per head per diem. Allowing that 10 per cent. on capital outlay would cover interest and charges, the provision of water, exclusive of the subsidiary arrangements for distribution and storage, would cost only Rs. 360, or about $6\frac{1}{2}$ pies per head per annum.

For domestic use therefore a water-supply by means of artesian wells would, if obtainable as cheaply as in the case of the well at Pondicherry, appear to be worthy of attention.

(2) For the Horticultural Gardens at Madras; for the Government Farm at Saidápet; a water-supply from artesian wells would probably be valuable beyond its cost, because in these cases water is wanted nearly all the year round, and it would be utilised under much more favorable circumstances than could possibly be secured in the case of ordinary irrigation.

7. Away from the coast artesian wells could not be made use of without a tolerably accurate knowledge of the strata, and only when those strata showed water-bearing material underlying impervious material. Where the subsoil consists of primary rocks within a short distance of the surface, as is the case over a very large part of Southern India, artesian wells would be inapplicable.

8. The Geological Department would probably be able to indicate where artesian wells might be sunk with some probability of successful results.

9. Should Government desire artesian wells to be experimentally tried, the Government Farm at Saidápet, which is understood to be much in need of a water-supply, would be the best place for a first experiment, and the results at Pondicherry may perhaps be taken as a rough guide as to what might be expected at Madras. The pipes used at the Jardin d'Acclimatation appear to have had a diameter throughout of 0·26 of a metre equal to nearly $10\frac{1}{4}$ inches, or 0·853 of a foot. The area of the pipe would therefore be 0·57 square foot, and the velocity of the water issuing therefrom 41·2 feet a minute or 0·69 foot a second only. The pipes used cost* 4·68 rupees a foot. The thickness of the metal and the weight are not stated.

* 263·472 feet; Rs. 1,710.

OOTACAMUND,
27th August 1879.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

TRANSFERRED to the Revenue Department with reference to the Honorable Mr. Hudleston's Note.

(Signed) JOHN MULLINS, Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

COMMUNICATED to the Revenue Board, the Geological Survey Department, the President of the Madras Municipality and the Presidents of all Mofussil Municipal Commissions with a copy of the Proceedings of Government, dated July 7th, 1879, No. 1,426, and with the suggestion that the French proprietors of the well-sinking machinery may possibly be willing to undertake artesian well-sinking by contract.

2. The Government await any suggestions the Board may have to offer relative to the trial of an artesian well at the Saidápet Farm.

3. The Geological Survey Department are requested to furnish Government with such information as is available regarding the localities in the Presidency in which artesian well-sinking is likely to be attended with success.

(True Extract.)

(Signed) J. H. GARSTIN,
Acting Secretary to Government.

No. 1-A. Proceedings of the Madras Government in the Revenue Department, dated 4th November 1879, No. 2,138.

From W. KING, Esq., Deputy Superintendent, Geological Survey of India, to J. H. GARSTIN, Esq., C.S.I., Acting Secretary to Government, Revenue Department, dated Yercaud, 7th October 1879.

IN reply to the Order of Government (13th September 1879, No. 1,878), I have the honor to inform you that no suitable sites for artesian wells, properly so called, are known in this Presidency to the Geological Survey of India.

2. The present inquiry having however risen out of the discovery of the gushing wells at Pondicherry, I venture to make some remarks on these for the information of Government.

3. I use the term "gushing wells" in this connexion because the Pondicherry wells are not yet shown to be artesian, it being quite possible that the gush of water may be caused by the pressure of the superincumbent strata (in one case 79·52 metres in thickness) on a confined stratum of water instead of, as in a true artesian well, by the basonal water-stratum having a higher level at more distant area than that at the well vent. I myself do not recollect any higher environ of Pondicherry whence such a stratum of water could extend under the vent at the Jardin d'Acclimatation; hence I am led to speculate on the possibility of superincumbent pressure.

4. So far there is no direct evidence as to why these gushing wells should occur at Pondicherry. The first well, that of M. Charles Poulain, was struck, as it were, by chance, and the next under the Colonial Engineer was taken at random. The chances are that such wells may be struck on the Madras alluvial plot, or indeed anywhere else along the Coromandel alluvial border; the desideratum in any case being, according to my view, that they should be bored to a sufficient depth to ensure a good pressure of overlying strata.

5. The fact remains, however, that wells having a gush over surface level have been struck at Pondicherry; hence it may be assumed that there is a possibility of striking the same kind of water sources on any alluvial stretch similar and similarly placed to that of the French possession. In some respects the Madras alluvial plot agrees with that of Pondicherry; as, for instance, below the Red Hills, though the Cuddalore, Nellore, and Cocanada plots are much more similarly placed in regard to adjacent high ground.

6. My own recollection of the Pondicherry plot only allows me to carry the comparison so far, but it is possible that were I to revisit that ground I might be able to run the argument closer. Should the Government approve of my visiting Pondicherry for this purpose, my services are of course at their disposal on my being placed in communication with the French Government at that station.

7. Experiments might certainly prove successful at the Government Farm at Saidápet or at the Horticultural Gardens, but as long as the search is one of mere guess-work it is a question whether the development of this source of water-supply might not be left to private enterprise which in this way has been successful so far at Pondicherry.

COMMUNICATED to the Board of Revenue, the President of the Madras Municipality, and the Presidents of all Mofussil Municipal Commissions.

2. Mr. King is entitled to the thanks of Government for his report.

(True Extract.)

(Signed) J. H. GARSTIN,
Acting Secretary to Government.

No. 2. ORDER THEREON, 1st December 1879, No. 706 I.

RECORDED, and communicated to Superintending Engineers.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.
Establishment.

Read the following paper :—

No. 3. Proceedings of the Board of Revenue, dated 22nd November 1879, Mis. No. 10,989.

From W. WILSON, Esq., Collector of Coimbatore, on special duty, Irrigation Accounts, to the Acting Secretary to Government, Revenue Department, (through the Board of Revenue,) dated Coimbatore, 17th November 1879, No. 3.

I HAVE the honor to inform you that under the sanction given in G.O., No. 443-A I., dated 7th August 1879, Public Works Department, and with reference to the orders of Government noted in the margin, I have entertained the following establishment for the compilation of Irrigation Accounts from the dates specified :—

20th September 1879, No. 1,911, R.D.
22nd „ „ „ 553 T., P.W.D.

Manager on	Rs.	350	from 7th October 1879.
Three Accountants on	,,	25	from 11th October 1879.
One Accountant on	,,	20	
,, Moochy on	,,	12	
,, Peon on	,,	8	

The rest from and after the 16th November 1879.

2. The small establishment entertained from the 7th October was first employed in reconciling the differences commented on by the Government of India in their letter No. 56-A I., dated 15th March 1879, between the Kistna Accounts for 1875-76 as submitted from this Office and those forwarded by Government to the Government of India, on the basis of figures drawn up in the Board's Office. The required explanation was given in this Office No. 5, dated 1st November 1879.

3. The establishment will be distributed as follows :—

District.	Taluks.	Establishment.
Nellore ...	Nellore	Two Accountants.
	Gúdúr	One Accountant.
North Arcot.	Wálajápet	Two Accountants.
	Arcot	Do.
Tinnevelly ...	Tenkarai and Otapidáram ...	Do.
Tanjore ...	Tanjore	Do.
	Combaconum	Do.
	Máyavaram	Do.
	Shiyáli	Do.
	Nannilam	Do.
	Negapatam	Do.
	Tiruturaipúndi	Do.
	Mannárgudi	Do.
Trichinopoly.	Patukóta	One Accountant.
	Udayárpálaiyam	
Chingleput ...	Saidápet	Two Accountants.
South Arcot ..	Chidambaram	Do.
Central Office		One Manager. One Head Accountant. Two Accountants. Two Clerks. Three Office Servants.

4. I shall, with reference to G.O., No. 2,159-A, dated 8th November 1879, Revenue Department, intimate in due course when I propose to leave my district on a tour of inspection.

SUBMITTED to Government with reference to the orders quoted and communicated to Collectors concerned.

(True Copy and Extract.)

(Signed) C. A. GALTON,
Acting Secretary.

To the Secretary to Government, Public Works Department.

No. 4. ORDER THEREON, 4th December 1879, No. 709 I.

RECORDED, in continuation of Proceedings of the Madras Government, No. 443-A I., dated 7th August 1879, and No. 553 I., dated 22nd September 1879.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.
Account.

Read the following paper :—

No. 320 I.

No. 5. *Note by the Chief Engineer for Irrigation.*

Statement of Objectionable Items for August 1879, dated 4th November 1879.

THE orders passed in G.O., No. 436 I. of the 1st August, No. 540 I. of the 17th September, and No. 620 I. of the 17th October 1879, respectively, have dealt with all the items except the following :—

(1.) Without estimate and appropriation—

	RS.
Bellary.	
Item 1.—Pátakottahcheru Tank	287
Kistna Western Delta.	
Item 14.—Outlet at Apparu	242
Vellore.	
Item 21.—Compensation for land taken up for raising embankments in north and south sides of the Palar river	496
Kistna Eastern Delta.	
Item 23.—Main Canal, C. Works	296

Superintending Engineers concerned must see that the irregularities are immediately corrected.

(2.) Without estimates—

	RS.
Kistna Western Delta.	
Item 31.—Commamur Canal, compensation for land	594
Madanapalle.	
Item 35.—Sanki bunda Pedda Cheruvu repairs	272
Trichinopoly.	
Item 47.—Kodiampolliem surplus calingulah repairs	220

The attention of Superintending Engineers concerned is drawn to these irregularities.

(3.) Excess over estimate—

		RS.
	Godávari Eastern and Central Delta.	
Item 58.	Bank Canal, L. Earthworks	304
	Kistna Eastern Delta.	
Item 71.	Ellore Canal, C. Works	272
„ 72.	Masulipatam Canal, I. Navigation	530
„ 73.	Ryve's Canal, C. Works	220
„ 74.	Western Delta Head Works, C. Works	500
	Chingleput.	
Item 111.	Peralumpaukam Tank	412

Superintending Engineers of the First and the Third Circles will see that revised estimates are sanctioned by them without delay.

(4.) Excess over appropriation—

		RS.
	Kistna Eastern Delta.	
Item 18.	Masulipatam Canal, I. Navigation	530
„ 19.	Western Delta Head Works, Capital Works	500
	Vizagapatam.	
Item 21.	Godari Anicut	1,630

No expenditure should have been incurred before funds were provided. The Superintending Engineer, First Circle, should send his application for re-arrangement of funds at an early date.

(5.) Works completed without estimate—

Items 1 to 10.

The Examiner of Public Works Accounts may be authorised to pass the expenditures on these items. Superintending Engineers should be careful in future not to incur any outlay without sanctioned estimates unless they are emergent.

(6.) Completion reports for forty-five works estimated at above Rs. 2,500 each, besides those for several other works below 2,500 rupees, have not been sent in. Superintending Engineers should impress upon the Executive Officers the importance of a more punctual submission of completion certificates.

(7.) Work abstract for works above 10,000 rupees not submitted to the Examiner of Public Works Accounts.

The nineteen items of July have become twenty in August. Those not shown in the former return are noted below, and the Executive Engineers concerned must see that they are punctually furnished to the Examiner of Public Works Accounts:—

		RS.
Item 1.	Perundurai Anicut.—Restoring the breached portion ...	34,155
„ 10.	Ryve's Canal.—Widening near Manivada	58,180
„ 11.	Bridge at Nadamanur	12,440
„ 12.	Masulipatam Canal.—Inampudi under tunnel construction	22,100
„ 14.	Marandahully Project	1,50,000
„ 15.	Baroor Project	52,688
„ 16.	Pennagondapuram Project	29,060
„ 19.	Regulating works of Korayaur, &c., head	65,775
„ 20.	Do. for Kodamurty and Thirumalarajanar river ...	31,380

CHEPAUK, (Signed) C. VINCENT,
26th November 1879. *for* Chief Engineer for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 6. ORDER THEREON, 4th December 1879, No. 710 I.

THE attention of Superintending Engineers concerned will be drawn to the remarks of the Chief Engineer for Irrigation, and they will be directed to use their best efforts to reduce the present excessive number of Objectionable Items.

2. The Examiner of Public Works Accounts is authorised to pass the expenditure incurred on works in this list completed without estimates.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following paper :—

No. 7. Endorsement of the Chief Engineer for Irrigation, dated Chepauk, 26th November 1879, No. 319 I.

From J. W. RUNDALL, Esq., Acting Superintending Engineer, Fifth Circle, to the Chief Engineer for Irrigation, dated Trichinopoly, 21st November 1879, No. 1,029 M.D.

I HAVE the honor to bring to your notice that the Executive Engineer, Madura Division, has forwarded to me two lists showing that small sums, being deductions of 15 per cent. owing to works not having been inspected by a qualified officer, are due on seventy-nine works in the late Madura Division, and on seventy-one works in the late Dindigul Division, the aggregate amount due being Rs. 4,498-9-1.

2. Some of these amounts are due for more than four years, and it is unnecessary to say that no proper check measurements can be made after a delay of this kind, yet it is hard to keep men out of their money because the Public Works Establishment has been either insufficient or inefficient. Extra officers were sent down to assist in supervising the repair of the numerous works damaged in 1877, but these should not have been removed till the works had been inspected and the accounts adjusted.

3. Since the District Engineer system was abolished, Mr. Hutchings, Assistant Engineer, has been in charge of the Madura Division, and Mr. Harington of the Dindigul Division. I think, however, that the bad health of the former officer has prevented his inspecting as many works as he would otherwise have done.

4. I write therefore to request authority to pay off these balances without waiting for the inspection required by the rules.

5. At present the division is in temporary charge of a Supervisor, but instructions will be given that, as far as possible, these works be inspected and checked; but I think it desirable there should be no further delay in clearing off liabilities.

6. The delay which has occurred in the payment for work executed is most prejudicial to the interests of Government, for the same is the case as regards Local Fund works also; I trust therefore that the authority now applied for may, under the circumstances, be granted.

SUBMITTED to Government.

2. The men to whom balances are due should, it is considered, be paid at once. If the establishment of a division is unable to check completed works within three months at most of the date of completion, the creditors of Government should be paid. The rules of a properly organized Public Works Department have been inapplicable to the actual circumstances of the department in many divisions for a long time past.

(Signed) JOHN MULLINS, Colonel, R.E.,
Chief Engineer for Irrigation.

No. 8. ORDER THEREON, 6th December 1879, No. 711 I.

THE Superintending Engineer is authorised to direct the payment of balances due, without further examination of the work done, in all cases in which undue delay has already occurred, unless he be of opinion that the establishment available is capable of carrying out the check required by the rules, and that an effectual check is still possible.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.
Account.

Read the following paper :—

No. 9. From Captain H. LEM. CAREY, Officiating Examiner of Public Works Accounts, to the Chief Engineer for Irrigation, dated Madras, 8th November 1879, No. 21 E.I.

Examiner's letter No. 345 S.E. 2nd, of 13th August 1879.
Superintending Engineer's No. 2,841 of 6th October 1879, with three enclosures A, B, and C.

I HAVE the honor to forward herewith copies of correspondence as per margin, anent the estimate of, and the expenditure incurred on, the Survapally project.

2. The original estimate of the Survapally project, as sanctioned by Government of India, amounts to Rs. 4,12,100, *vide* Proceedings, Madras Government, Nos. 1,844 and 3,215, dated 20th June 1867 and 12th October 1868, respectively.

3. The expenditure of the project, as shown in the books of this and the Divisional Offices up to end of the official year 1878-79, is Rs. 4,32,968-12-9.

This amount includes—

(1).—Rs. 12,439-14-4, representing outlay incurred on the Golagamudi channel (*vide* Statement No. I, appended), which should be removed from the expenditure against Survapally project estimate for inclusion in the completion estimate of the Pennér Anicut System.

(2).—Rs. 521-9-8, outlay on works to be removed to extensions and improvements, to which head, they are properly chargeable (*vide* Statement No. II, appended).

(3).—Rs. 133-3-4, outlay on works to be removed to Maintenance and Repairs, to which head they are correctly debitable (*vide* Statement No. III, appended).

Deducting these amounts the total expenditure against the estimate 4,12,100 comes to Rs. 4,19,874-1-5 (*vide* Statement No. IV), to this sum, if Rs. 6,250 which is required, as stated by the Superintending Engineer, to pay up old claims on account of land compensation, be added, the whole expenditure would amount to Rs. 4,26,124, or Rs. 14,024 in excess of the original estimate, the excess being a little over 3 per cent.; and as this excess is within the competency of the Local Government to sanction, and as the work is completed, a completion report sanctioned by Government would, I think, be all that is now necessary.

4. If you agree with me, I request that you will submit the case for the orders of Government.

No. 10. ORDER THEREON, 6th December 1879, No. 712 I.

IT appearing from the foregoing letter from the Examiner of Public Works Accounts that the expenditure on the Survapally project of the Pennér Anicut

System amounts to Rs. 4,19,874-1-5; that the works have been completed, and that the only further expenditure needed is a sum of Rs. 6,250 for land compensation, the Examiner is authorised to pass the expenditure, and bills for land compensation when submitted in proper form, the total excess being Rs. 14,024, or a little more than 3 per cent. on the sanction of Rs. 4,12,100 by the Government of India for the project.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following papers :—

No. 11. From G. T. WALCH, Esq., Acting Superintending Engineer, First Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 14th April 1879, No. 81 G.D.

WITH reference to your memorandum No. 177 G.D., dated 25th September 1877, I have the honor to forward herewith sections and estimates as per margin, for raising the right bank of the Vasista Godávari from 35 miles to its end at Narasápur lock together with Lieutenant Dorward's letter No. 384, dated 20th December 1878, and to state that as I agree† with Lieutenant Dorward as to the levels to which only it will be necessary to raise this bank, I have altered the sections in red and prepared a revised estimate accordingly. It will be noticed that in this estimate is included Rs. 5,000, the approximate amount that will have to be paid for compensation for the whole embankment from the anicut to Narsápur lock, as also a sum of Rs. 2,378-4-0, being the expenditure already incurred‡ in 1876-77 for protecting the river bank at Yenuguvani lunka. The total estimate for raising the bank from the anicut to Narsápur lock (including the portions altered in sections in red) is Rs. 65,200§.

* 5 Sheets of cross sections.
* 1 Sheet of longitudinal section.
1 Revised estimate as per alterations in red in sections.
1 Letter of Lieutenant Dorward.

* Despatched by Banghy.

† See paragraph 3 of Chief Engineer's No. 177 G.D., dated 25th September 1877.

‡ Charged under the head Ordinary Agricultural Original Works, River embankments.

	RS.
§ From anicut to 35 miles	42,700
From 35 miles to Narsápur lock ...	22,500
Total ...	65,200

No. 317 I.

No. 11-A. *Note by the Chief Engineer for Irrigation.*

ESTIMATES for the reformation of the right flood-bank of the Vasista Godávari from the Vijeshwaram under-sluices were submitted by the District Engineer in May 1876, since which time the proposed arrangements have undergone further investigation with a view of obtaining throughout the best line available and limiting the height of the embankment to the level essential to security.

2. The estimates, as first prepared, amounted to Rs. 77,300, and the length of embankment was 50 miles 597 yards. Compensation, however, had not been adequately provided for. The estimate now recommended for sanction amounts to Rs. 65,200, and this includes Rs. 5,000 for compensation for land to be taken up permanently or occupied temporarily, and also Rupees 2,378-4-0 the cost of the protection of the river bank at Yenuguvani lunka, so that the reduction effected is not far short of Rs. 20,000. The length of the flood-bank has likewise been diminished to 47 miles.

3. The correspondence sufficiently explains the reasons which have led to the several alterations made, and it may be enough here to mention that it has been ascertained that the difference between the flood levels of 1875 and 1878 diminished from 2·21 feet at 5 miles from the anicut to 0·58 feet at 35 miles from that point, while at Narsápur lock, 47 miles, these levels were almost exactly the same. These facts have been taken as the basis for estimating the water levels with a fresh like that of 1861, the highest on record, of which the levels at various points below the anicut were not recorded, and generally the flood-bank is to be 4 feet above M.F.L., where a road is not carried on the bank, while the margin is to be 3 feet where the bank is combined with a road and will consequently be much thicker.

Letter from Executive Engineer, W.D. Division, No. 384, 20th December 1878.

4. The estimate as revised, as shown in the accompanying abstract, is recommended for sanction as follows :—

Agricultural.

River Embankments.

Original Works.

Vasista Godávari—Improving right flood-bank from anicut to Narsápur lock... ... ... RS. 65,200

The original estimate for this flood-bank was entered in the list submitted to the Government of India in a letter No. 385 I., of the 9th October 1877, and in reply the Government of India accorded their sanction to this and the whole of the estimates shown in the list.

Proceedings, Madras Government, No. 112 I., dated 7th February 1878.

CHEPAUK,
25th November 1879.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

Raising Vasista Godávari Right Flood-bank from Anicut to Narsápur Lock.

Quantity.	Description of Work.	Rate.	Per.	Amount.	Total.
		RS. A. P.		RS. A. P.	RS. A. P.
	1st Mile.				
6,893 C. yds.	Earth-work	0 1 3	C. yd.	538 8 3	
...	Cattle crossing	...	,,	75 0 0	
...	Planting aloes	...	,,	6 0 0	
...	Contingencies	...	,,	30 7 9	
					650 0 0
	2nd Mile.				
8,116 C. yds.	Earth-work	0 1 3	C. yd.	634 1 0	
...	Cattle crossing... ...	...	,,	75 0 0	
...	Planting aloes	...	,,	6 0 0	
...	Contingencies	...	,,	34 15 0	
					750 0 0
	3rd Mile.				
9,436 C. yds.	Earth-work	0 1 3	C. yd.	737 3 0	
...	Cattle crossing... ...	...	,,	86 0 0	
...	Planting aloes	...	,,	7 0 0	
...	Contingencies	...	,,	44 13 0	
					875 0 0
	4th Mile.				
9,484 C. yds.	Earth-work	0 1 3	C. yd.	740 15 0	
...	Contingencies	...	,,	39 1 0	
					780 0 0

Raising Vasista Godávari Right Flood-bank from Anicut to Narsápur Lock—*cont.*

Quantity.	Description of Work.	Rate.	Per.	Amount.	Total.
		RS. A. P.		RS. A. P.	RS. A. P.
	5th Mile.				
8,018 C. yds.	Earth-work	0 1 3	C. yd.	626 6 6	
...	Cattle crossing	...	„	180 0 0	
...	Planting aloes	...	„	16 0 0	
...	Contingencies	...	„	42 9 6	
					865 0 0
	6th Mile.				
...	Cattle crossing	...	C. yd.	100 0 0	
...	Planting aloes	...	„	10 0 0	
...	Contingencies	...	„	5 0 0	
					115 0 0
	7th Mile.				
1,173 C. yds.	Earth-work	0 1 3	C. yd.	91 10 3	
...	Contingencies	...	„	3 5 9	
					95 0 0
	8th Mile.				
6,209 C. yds.	Earth-work	0 1 3	C. yd.	485 1 3	
...	Cattle crossing	...	„	175 0 0	
...	Planting aloes	...	„	15 0 0	
...	Contingencies	...	„	34 14 9	
					710 0 0
	9th Mile.				
6,796 C. yds.	Earth-work	0 1 3	C. yd.	530 15 0	
...	Cattle crossing	...	„	65 0 0	
...	Planting aloes	...	„	6 0 0	
...	Contingencies	...	„	28 1 0	
					630 0 0
	10th Mile.				
8,556 C. yds.	Earth-work	0 1 3	C. yd.	668 7 0	
...	Cattle crossing	...	„	35 0 0	
...	Planting aloes	...	„	4 0 0	
...	Contingencies	...	„	37 9 0	
					745 0 0
	11th Mile.				
10,609 C. yds.	Earth-work	0 1 3	C. yd.	828 13 3	
...	Cattle crossing	...	„	80 0 0	
...	Planting aloes	...	„	8 0 0	
...	Contingencies	...	„	48 2 9	
					965 0 0
	12th Mile.				
6,844 C. yds.	Earth-work	0 1 3	C. yd.	534 11 0	
...	Cattle crossing	...	„	45 0 0	
...	Planting aloes	...	„	6 0 0	
...	Contingencies	...	„	29 5 0	
					615 0 0
	13th Mile.				
4,938 C. yds.	Earth-work	0 1 3	C. yd.	385 12 6	
...	Cattle crossing	...	„	354 0 0	
...	Planting aloes	...	„	25 0 0	
...	Contingencies	...	„	40 3 6	
					805 0 0

Raising Vasista Godávari Right Flood-bank from Anicut to Narsápur Lock—*cont.*

Quantity.	Description of Work.	Rate.	Per.	Amount.	Total.
		RS. A. P.		RS. A. P.	RS. A. P.
	14th Mile.				
5,524 C. yds.	Earth-work	0 1 3	C. yd.	431 9 0	
...	Cattle crossing... ...	...	,,	65 0 0	
...	Planting aloes	...	,,	6 0 0	
...	Contingencies	...	,,	22 7 0	
					525 0 0
	15th Mile.				
4,253 C. yds.	Earth-work	0 1 3	C. yd.	332 4 3	
...	Cattle crossing	...	,,	65 0 0	
...	Planting aloes	...	,,	6 0 0	
...	Contingencies	...	,,	21 11 9	
					425 0 0
	16th Mile.				
12,760 C. yds.	Earth-work	0 1 3	C. yd.	996 14 0	
...	Cattle crossing... ...	...	,,	90 0 0	
...	Planting aloes	...	,,	8 0 0	
...	Contingencies	...	,,	55 2 0	
					1,150 0 0
	17th Mile.				
17,404 C. yds.	Earth-work	0 1 3	C. yd.	1,359 11 0	
...	Cattle crossing... ...	...	,,	187 0 0	
...	Planting aloes	...	,,	16 0 0	
...	Contingencies	...	,,	77 5 0	
					1,640 0 0
	18th Mile.				
17,844 C. yds.	Earth-work	0 1 3	C. yd.	1,394 1 0	
...	Cattle crossing	...	,,	172 0 0	
...	Planting aloes	...	,,	13 0 0	
...	Contingencies	...	,,	80 15 0	
					1,660 0 0
	19th Mile.				
11,880 C. yds.	Earth-work	0 1 3	C. yd.	928 2 0	
...	Cattle crossing... ...	...	,,	58 0 0	
...	Planting aloes	...	,,	6 0 0	
...	Contingencies	...	,,	52 14 0	
					1,045 0 0
	20th Mile.				
15,058 C. yds.	Earth-work	0 1 3	C. yd.	1,176 6 6	
...	Cattle crossing	...	,,	129 0 0	
...	Planting aloes	...	,,	12 0 0	
...	Contingencies	...	,,	67 9 6	
					1,385 0 0
	21st Mile.				
9,876 C. yds.	Earth-work	0 1 3	C. yd.	771 9 0	
...	Cattle crossing	...	,,	46 0 0	
...	Planting aloes	...	,,	6 0 0	
...	Contingencies	...	,,	41 7 0	
					865 0 0
	22nd Mile.				
11,049 C. yds.	Earth-work	0 1 3	C. yd.	863 3 3	
...	Cattle crossing... ...	...	,,	110 0 0	
...	Planting aloes	...	,,	14 0 0	
...	Contingencies	...	,,	47 12 9	
					1,035 0 0

Raising Vasista Godávari Right Flood-bank from Anicut to Narsápur Lock—*cont.*

Quantity.	Description of Work.	Rate.	Per.	Amount.	Total.
	23rd Mile.	RS. A. P.		RS. A. P.	RS. A. P.
17,405 C. yds.	Earth-work	0 1 3	C. yd.	1,359 12 3	
...	Cattle crossing	...	"	112 0 0	
...	Planting aloes	...	"	16 0 0	
...	Contingencies	...	"	72 3 9	
					1,560 0 0
	24th Mile.				
23,516 C. yds.	Earth-work	0 1 3	C. yd.	1,837 3 0	
...	Cattle crossing	...	"	333 0 0	
...	Planting aloes	...	"	38 0 0	
...	Contingencies	...	"	111 13 0	
					2,320 0 0
	25th Mile.				
28,307 C. yds.	Earth-work	0 1 3	C. yd.	2,211 7 9	
...	Cattle crossing	...	"	17 0 0	
...	Planting aloes	...	"	5 0 0	
...	Contingencies	...	"	116 8 3	
					2,350 0 0
	26th Mile.				
22,538 C. yds	Earth-work	0 1 3	C. yd.	1,760 12 6	
...	Cattle crossing	...	"	212 0 0	
...	Planting aloes	...	"	30 0 0	
...	Contingencies	...	"	102 3 6	
					2,105 0 0
	27th Mile.				
18,627 C. yds.	Earth-work	0 1 3	C. yd.	1,455 3 9	
...	Cattle crossing	...	"	190 0 0	
...	Planting aloes	...	"	25 0 0	
...	Contingencies	...	"	84 12 3	
					1,755 0 0
	28th Mile.				
12,662 C. yds.	Earth-work	0 1 3	C. yd.	989 3 6	
...	Cattle crossing	...	"	178 0 0	
...	Planting aloes	...	"	20 0 0	
...	Contingencies	...	"	57 12 6	
					1,245 0 0
	29th Mile.				
19,116 C. yds.	Earth-work	0 1 3	C. yd.	1,493 7 0	
...	Contingencies	...	"	76 9 0	
					1,570 0 0
	30th Mile.				
24,444 C. yds.	Earth-work	0 1 3	C. yd.	1,909 11 0	
...	Cattle crossing	...	"	233 0 0	
...	Planting aloes	...	"	25 0 0	
...	Contingencies	...	"	102 5 0	
					2,270 0 0
	31st Mile.				
24,151 C. yds.	Earth-work	0 1 3	C. yd.	1,886 12 9	
...	Cattle crossing	...	"	135 0 0	
...	Planting aloes	...	"	13 0 0	
...	Contingencies	...	"	100 3 3	
					2,135 0 0

Raising Vasista Godávari Right Flood-bank from Anicut to Narsápur Lock—*cont.*

Quantity.	Description of Work.	Rate.	Per.	Amount.	Total.
		RS. A. P.		RS. A. P.	RS. A. P.
	32nd Mile.				
21,951 C. yds.	Earth-work	0 1 3	C. yd.	1,714 14 9	
...	Cattle crossing	...	„	45 0 0	
...	Planting aloes	...	„	5 0 0	
...	Contingencies	...	„	90 1 3	
					1,855 0 0
	33rd Mile.				
19,116 C. yds.	Earth-work	0 1 3	C. yd.	1,493 7 0	
...	Cattle crossing	...	„	7 0 0	
...	Planting aloes	...	„	2 0 0	
...	Contingencies	...	„	72 9 0	
					1,575 0 0
	34th Mile.				
21,071 C. yds.	Earth-work	0 1 3	C. yd.	1,646 2 9	
...	Cattle crossing	...	„	75 0 0	
...	Planting aloes	...	„	7 0 0	
...	Contingencies	...	„	86 13 3	
					1,815 0 0
	35th Mile.				
20,338 C. yds.	Earth-work	0 1 3	C. yd.	1,588 14 6	
...	Cattle crossing	...	„	162 0 0	
...	Planting aloes	...	„	18 0 0	
...	Contingencies	...	„	86 1 6	
					1,855 0 0
	36th Mile.				
11,990 C. yds.	Earth-work	0 1 3	C. yd.	936 11 6	
...	Contingencies	...	„	48 4 6	
					985 0 0
	37th Mile.				
11,220 C. yds.	Earth-work	0 1 3	C. yd.	876 9 0	
..	Contingencies	...	„	43 7 0	
					920 0 0
	38th Mile.				
29,155 C. yds.	Earth-work	0 1 3	C. yd.	2,277 11 9	
...	Contingencies	...	„	112 4 3	
					2,390 0 0
	39th Mile.				
19,230 C. yds.	Earth-work	0 1 3	C. yd.	1,502 5 6	
...	Contingencies	...	„	77 10 6	
					1,580 0 0
	40th Mile.				
18,610 C. yds.	Earth-work	0 1 3	C. yd.	1,453 14 6	
...	Contingencies	...	„	76 1 6	
					1,530 0 0
	41st Mile.				
13,459 C. yds.	Earth-work	0 1 3	C. yd.	1,051 7 9	
...	Contingencies	...	„	53 8 3	
					1,105 0 0

Raising Vasista Godávari Right Flood-bank from Anicut to Narsápur Lock—*cont.*

Quantity.	Description of Work.	Rate.	Per.	Amount.	Total.
	42nd Mile.	RS. A. P.		RS. A. P.	RS. A. P.
10,130 C. yds.	Earth-work	0 1 3	C. yd.	791 6 6	
...	Contingencies	...	,,	43 9 6	
					835 0 0
	43rd Mile.				
22,020 C. yds.	Earth-work	0 1 3	C. yd.	1,720 5 0	
...	Contingencies	...	,,	84 11 0	
					1,805 0 0
	44th Mile.				
26,290 C. yds.	Earth-work	0 1 3	C. yd.	2,053 14 6	
...	Contingencies	...	,,	106 1 6	
					2,160 0 0
	45th Mile.				
11,100 C. yds.	Earth-work	0 1 3	C. yd.	867 3 0	
...	Contingencies	...	,,	42 13 0	
					910 0 0
	46th Mile.				
4,004 C. yds.	Earth-work	0 1 3	C. yd.	312 13 0	
...	Contingencies	...	,,	17 3 0	
					330 0 0
	46½ Mile.				
924 C. yds.	Earth-work	0 1 3	C. yd.	72 3 0	
...	Contingencies	...	,,	2 13 0	
					75 0 0
...	Protecting river bank at Yenuguvani lunka (actual cost) incurred in 1876-77.	...	...	...	2,378 4 0
...	Compensation for land for the whole distance from anicut to Narsápur.	...	...	...	5,456 12 0
	Grand Total Estimate ...	...	...	...	65,200 0 0

CHETTIPETT,
10th September 1879.

(Signed) J. C. LARMINIE,
Ex. Engr., Western Delta Division,
Godávari District.

From Major J. BEATTY, R.E., District Engineer, Godávari District, to the Chief Engineer for Irrigation, and Joint Secretary to Government, Public Works Department, dated Dowlaishweram, 9th May 1876, No. 321.

I HAVE the honor to submit herewith two estimates for raising the 45 miles of the river embankment in the Western Delta to a height of 4 feet above the highest recorded floods. The one estimate is for the upper 35 miles, and the other for the remaining 15 miles.

1 Original letter from the Officer in charge, Western Delta Division, No. 402, dated 13th December 1875.
1 Do. do. No. 65, dated 4th April 1876.
1 Longitudinal section of right bank of Vasista Godávari below anicut.
1 Cross section of do. do. for 35 miles.
1 Do. do. of the river bank.
2 Estimates.

2. On the sections is shown the surface level of the 13 feet fresh of 1875, and as the freshes of 1853 and 1861 rose to 15¼ feet upon the anicut, the Divisional Officer has proposed to make his embankment 6¼ feet above the maximum flood level of 1875.

3. In the fresh of 1875, Lieutenant Dorward had the surface level registered at every 5 miles, and you will observe that starting with 50·75 above mean sea level immediately below the anicut he finds a surface level of 15·50 at 35 miles down; giving an average surface slope of 1·05 in those 35 miles. In the 15 miles from the 35th to the 50th, the fall flattens out to ·54 feet per mile.

4. The estimates include gravelled cattle crossings where necessary, and they amount to Rs. 42,700 + 34,600 = Rs. 77,300. The top width provided for is 9 feet. The present bank is on the average 7·16 feet high, and it is proposed to raise it to 10·06.

5. Part of this line of embankment from 43 $\frac{3}{16}$ to 45 miles is in a dangerous state, having been already partially washed away in some places so that it has become emergently necessary to construct the new bank at that place. This I have authorised the officer in charge of the division to proceed with at once. At the same time the cause of the set on the opposite bank higher up is being dealt with, and it is hoped the erosion will take place lower down this year and prove less destructive.

6. I send also the letters (to be returned) of the Divisional Officers, submitting the estimates, for your information.

No. 59 G.D.

IRRIGATION—MEMORANDUM.

THE undersigned has the honor with reference to the letter No. 321 of the 9th ultimo, from the District Engineer, Godávari, forwarding estimates for flood embankments in the Western Delta, to observe that no reference has been made to the Bank Canal which nearly throughout runs close to the embankment, and on which earth-work to the extent of Rs. 20,000 was provided for in the completion estimate, part of which is shown by the cross sections to have been available for raising the left bank of the canal which is the flood-bank also.

2. The proper alignment of the flood-bank in the lower miles may need careful consideration, more particularly in connection with the outfalls of the Nakkala and Kaza drains.

3. It is observed that no turfing has been provided for in this Delta, and it has to be noticed that the proposals from the several Deltas should be consistent, and when the arrangements differ, the cause of difference should be noted. In this connection it has to be remarked that the top width of 12 feet of the Eastern Delta flood-bank, though probably demonstrable to be necessary in particular localities, can hardly be so everywhere if 9 feet will do in the Central and Western Deltas. Again, in the latter regular crossings had been provided for at intervals, a very necessary arrangement for the good order of the embankments; but in the other Deltas this important detail apparently has been lost sight of.

4. A large but very necessary expenditure is contemplated, and it is requisite that the proposals therewith connected should be placed before Government so clearly as to leave no room for doubt as to their propriety and completeness and as to all important details having been fully and carefully considered.

3rd June 1876. (Signed) JOHN MULLINS, Colonel, R.E.,
Chief Engineer for Irrigation.

From Lieutenant D. McNEIL CAMPBELL, R.E., Executive Engineer in charge, Godávari District, to the Chief Engineer for Irrigation, dated Dowlaishweram, 12th August 1876, No. 1,339.

WITH reference to your Memorandum, No. 59 G.D., dated 3rd June 1876, I have the honor to resubmit the plans and estimates as per margin for flood embankments in the Western Delta, together with a letter (to be returned) from Lieutenant Dorward giving the information you called for.

1 Cross sections of the river bank.
1 Cross sections of right bank of Vasista Godávari below anicut for 35 miles.
1 Longitudinal sections of do. do.
1 Estimate for raising right bank of Vasista Godávari below anicut to 35 miles.
1 Estimate for raising the river bank from 35 miles to Narsápur lock.
1 Letter from Lieutenant Dorward, No. 173, dated 31st July 1876.

2. With reference to paragraph 3 of your memorandum, I beg to observe that the embankment in the Eastern Delta also serves as a road along which there is a considerable deal of traffic, and it is for this reason that it is proposed to make top width 12 feet; the estimates for this embankment are now being revised, and allowance will be made for cattle crossings.

No. 104 G.D.

MEMORANDUM.

IN the estimates for river embankment, Western Delta, received with No. 321, 9th May 1876, from the District Engineer, Godávari, it is noticed that the one for the portion of the embankment from the anicut to 35 miles has no provision for compensation. It is possible that the reason for this was mentioned in the Divisional Officer's letters returned with No. 59 G.D., 3rd June 1876, but if so, it has been forgotten, and the Superintending Engineer is requested to be good enough to furnish explanation or information on the subject.

FORT ST. GEORGE,
6th June 1877.

(Signed) G. T. WALCH.

From Major J. BEATTY, R.E., Officiating Superintending Engineer, Godávari, to the Chief Engineer for Irrigation, dated Dowlaishweram, 14th June 1877, No. 843.

IN reply to your Memorandum No. 104 G.D. of 6th instant, I have the honor to inform you that in his letter submitting the estimate for raising right bank of Vasista Godávari for 35 miles below anicut, the Divisional Officer observed as follows :—

"No compensation for lands is allowed in the estimate as it will not be necessary to take up any permanently. The ryots will allow pits $\frac{1}{2}$ yard deep to be dug if assessment on the land actually taken up by the pits be remitted for two years and compensation given for any damage to crops. The average quantity of earth required per running yard is $7\frac{1}{2}$ cubic yards. Pits will therefore be on the average 15 yards wide, and assessment will have to be remitted on 190 acres for two years."

From G. T. WALCH, Esq., to the Superintending Engineer, Godávari, dated Fort St. George, 25th September 1877, No. 177 G.D.

WITH reference to the estimate (herewith) for the flood embankment for the right side of the Vasista Godávari from 35 miles to Narsápur lock which accompanied No. 321, 9th May 1876, from the Superintending Engineer, Godávari, and was resubmitted with his No. 1,339, 12th August 1876, the Superintending Engineer's attention is requested to the following remarks.

2. From the conformation of the river at that portion of its course, it seems unlikely that the margin of the river near the village of Yenuguvani lunka can be effectually protected from liability to severe erosion, and it would seem better to abandon the present line of embankment from the Chinchivada road ferry round the point to the Kaza drain outfall, and to make the line of road itself between the two points the line of defence against floods, raising it to 3 feet above M.F.L., which it may be remarked is not at that place likely to be the F.L. of 1875 + $2\frac{1}{4}'$ but something less. The line of road between the ferry and the Kaza outfall is some 2 miles shorter than that of the bank there estimated for; the ground along which the road runs is probably not much, if at all, below M.F.L., and it seems likely that whereas the portion of the bank under immediate notice is, according to the submitted estimate, expected to cost Rs. 11,435, the road can be raised to the required height for not much more than Rs. 1,500, or at all events for very much less than the cost of raising and reforming the existing river bank.

3. From 47 miles and 1,037 yards (Kaza outfall) to Narsápur lock, the existing embankment is a broad well-consolidated road, the level of which need not be more than 3′ above M.F.L., and as that is probably not so much at the place as $2\frac{1}{4}'$ above the F.L. of July 1875, the raising required will not be nearly so much as provided for in the estimate submitted.

4. The Superintending Engineer is requested to be good enough to forward as soon as may be a revised estimate for the portion of the embankment between 35 miles and Narsápur lock, prepared with reference to the above remarks.

5. It seems certain that, even though no land may be required to be taken up permanently for any of the work of embankment from Vijeshwaram to Narsápur, some compensation may have to be made for temporary occupation of land or injury to crops, and the Superintending Engineer is requested to fix an arbitrary sum which he may consider sufficient to include in the estimate when submitting it to Government.

No. 12. ORDER THEREON, 6th December 1879, No. 713 I.

THE estimate of Rs. 65,200 for improving the right flood-bank of the Vasista Godávari from the anicut to Narsápur lock is sanctioned against the approximate sums included in the Government of India sanction, No. 39 I of 1877-78.

2. This sanction has been registered as No. 53 I of 1879-80.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following paper :—

No. 13. From Lieutenant-Colonel H. L. PRENDERGAST, R.E., Superintending Engineer, Second Circle, to the Chief Engineer for Irrigation, dated Bellary, 10th November 1879, No. 3,342.

WITH reference to paragraph 38 of G.O., No. 436 I., dated 1st August 1879, I have the honor to explain that the Executive Engineer at Anantapur reports that the repairs to No. 5 weir of the Dharmavaram Tank were carried out on emergency in October 1878, by the order of Assistant Engineer Mr. Norfor, then in charge of the Pennukonda Range, and it was not possible to frame a correct estimate, as the tank was discharging during the whole time that the work was in progress. The work done is considered to have saved the tank and prevented loss of revenue. A revised completion certificate for the work has been sent to the Examiner of Public Works Accounts; and I request that the Examiner may be authorised to pass the outlay.

2. *Paragraph* 40 *of the G.O.—Item* 9, *Iduppalapoy River Channel.*—The outlay represents the value of materials collected in 1875-76 for the repair of the channel, but the work was subsequently abandoned. The Examiner suggested that the materials at site should be sold, and that after crediting the sale proceeds to the work a completion certificate should be sent in. A completion report has been prepared, but as it was not correct, it has been returned to the Executive Engineer at Cuddapah for correction on the 8th August.

3. *Paragraph* 40-*A.—Items* 22 *to* 34.—These works in connection with the Survapally project were completed in 1876. Completion reports for all these items, excepting Nos. 27 and 34, have been sent to the Examiner on the 6th October. The delay has been owing to the difficulty in tracing from the records the distribution of the expenditure under sub-heads.

No. 14. ORDER THEREON, 6th December 1879, No. 714 I.

UNDER the explanation afforded in the first paragraph of the above letter, the Examiner of Public Works Accounts will be authorised to pass the outlay incurred on the Dharmavaram Tank, Anantapur Division, without estimate.

2. A revised completion certificate in connection with the Iduppalapoy River Channel should be furnished to the Examiner without further delay.

3. Separate orders are about to issue in connection with the adjustment of the expenditure on the Survapally project, Pennér Anicut System.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Read the following papers :—

No. 15. Endorsement of the Chief Engineer for Irrigation, dated Fort St. George, 28th October 1879, No. 299 I.

From Major H. M. VIBART, R.E., Acting Superintending Engineer, Third Circle, to the Chief Engineer for Irrigation, dated 25th July 1879, No. 4,335.

WITH reference to last paragraph of G.O., No. 374 I., of 1st July 1879, I have the honor to forward a memorandum written by Captain A. C. Smith, regarding the construction of the Red Hills 10-vent sluice.

2. I am disposed to think that the failure of the floor was due, in the first place, to the sluice having been used when the masonry was green. I am informed that the stone lime made use of does not set very readily. I think it probable also that the concrete was rammed too much, and that the laterite material was crushed. It is possible that some chemical action was set up in the mixture by the oxide of iron in the laterite coming in contact with the lime, and I think it would be desirable to request the opinion of the Chemical Examiner on the point. I think in future it would be undesirable to use laterite in the formation of concrete. Captain Smith informs me that much care was taken in experimenting with various mixtures, and what was apparently the best was selected for use in the sluice. In my opinion it would have been better had the stratum of concrete below the cut-stone been 18 inches instead of 6 inches thick, and the old work cut down 1 foot to receive this.

Memorandum on the Construction of the Red Hills Dam Sluice.

The following facts regarding the construction and dates of inspection, &c., are obtained from private note books and official records.

On the 18th June 1876 the Supervisor in charge, Mr. F. Watkins, visited the work; gave instructions for the commencement thereof to the maistry and started the work; he shortly after this had to leave for equally important works at Kesavaram, at the head of the Bangaroo channel.

On the 27th June I visited the work on my way to Tamarapak head works, and again on 30th June on my return therefrom, and the following remark occurs in my inspection report for that date:—"There are now twenty-five stone-cutters at work, but a want of energy about it; I have ordered Supervisor to let all other works slide and come and live on the work till it is properly started." These were the masons employed in finally dressing and fitting the granite stones while work was going on while the floor concrete, &c., was being laid.

Agreeably to orders the Supervisor reached Red Hills on 1st July, and, with the exception of a few days, lived on the work all that month.

On or about 8th July I received a report of an outbreak of cholera on the work from Mr. Watkins, in consequence of which I proceeded thither on 10th July and remained there four days, leaving on 13th, during which period the floor was completed. (*N.B.*—Arrangements were of course made for sanitation and medical attendance and for preventing desertion from the work.) On 29th July I again visited this work, and found it complete up to beam stone level, and "beam stones being fixed."

This is the last record of my visit, as I shortly after proceeded on privilege leave; but the Supervisor remained almost entirely on the work until it was completed.

The flooring was constructed in strips, *i.e.*, as soon as a portion of granite stones was ready for laying, the necessary amount of concrete was laid and rammed, and so on, the whole being watered well during and after construction.

With regard to the composition of the concrete for this work, there are no written orders in existence, nor probably were any specific orders given for this particular work. Instructions on the composition and manufacture of concrete had been from time to time issued, more particularly with reference to Dr. Nicholson's experiments with various kinds of lime stones. But orders were verbally given, and I know were carried out, that the concrete for this work should be composed of materials and in the same proportion as those ascertained to be the best in a series of experiments carried on at Tamarapak. The mortar used in this instance was composed as follows:—

1 part stone lime,
1¾ „ soorki,
2 „ sand,

and two parts of clean laterite gravel were used to one of the above mortar, the latter being compounded only immediately before use. A basket of the above concrete placed (with many others) in a quiet pool in the river set hard in thirty-six hours, and required a crowbar to break its mass.

Such was the concrete used on the work.

In conclusion, I may perhaps note the probable causes of failure in the setting of the concrete thus used.

It appears to me there may be two, one mechanical, the other chemical, and both owing to the use of laterite gravel.

The mechanical fault may have been caused by over-ramming, and thus breaking the nodules of gravel and exposing a soft and soluble interior. The chemical, by the action of the lime when brought into contact with the clay and iron portions of the gravel employed.

Specimens of the results of the experiments at Tamarapak were stored there, the best being sent to the Range Office at the Mount; if these could be found it would be interesting to know whether any disintegrating action had set up in their masses, for if not this would tend to show that the fault lay in probable over-ramming. The basket specimens were not rammed as on a work, but merely pressed into the baskets, and hence perhaps their setting power was not interfered with by the crushing of the laterite.

(Signed) A. C. SMITH, Captain, R.E.,
Executive Engineer.

No. 15-A. From J. W. RUNDALL, Esq., Acting Superintending Engineer, Fifth Circle, to the Chief Engineer for Irrigation, dated Kodaikánal, 26th September 1879, No. 495 T.C.

I have the honor to forward herewith an explanation from Supervisor Mr. Watkins regarding the 10-vent surplus sluices built by him.

This has been delayed because, in the first instance, Mr. Watkins, instead of furnishing the information now given, applied to be allowed to proceed to Madras to see the work itself and refer to the records. I instructed him that he should, in the first instance, give such information as he could from memory, and that if you did not consider this satisfactory and wished for further details, he could then be allowed to get them from his late office records.

From Mr. F. WATKINS, Supervisor, Public Works Department, Trichinopoly District, to the Executive Engineer, Trichinopoly Division, dated Trichinopoly, 19th September 1879, No. 8.

With reference to your endorsement No. 1,245, of the 5th instant, on the Superintending Engineer's letter to your address, No. 412 T.C.,* of the 1st idem, calling upon me to state from memory what I know of the work referred to in memorandum No. 41 V, from the Chief Engineer for Irrigation, I beg to state that, to the best of my recollection, the concrete made use of under the flooring stones of the surplus sluices in the Red Hills Tank surplus weir was composed of two parts of laterite jelly to one of mortar, composed of—

* Returned enclosed.

1 part slaked stone lime.
1¾ ,, soorki.
2 ,, sand.

The above proportions for the composition of the mortar were selected by the Executive Engineer after making several experiments at the Tamarapak anicut, where the restoration of the damaged portion of the foundation of that work was about being commenced, and as one part of mortar prepared as above to two parts of laterite jelly set speedily and hard under submersion within the space of two days, these proportions were ordered by the Executive Engineer to be used at the Tamarapak anicut, and subsequently at the Red Hills Tank surplus sluices, on which similar lime stone was used as that made use of on the former work.

As regards the third point on which information is called for, I beg to state that I am unable to afford any explanation as to the cause of the failure of the ashlar flooring, as I have not seen the work since it was damaged, nor am I aware of the nature and extent of the injuries it has sustained; but I was greatly surprised when hearing of the failure of this work, on which so much care and attention was bestowed during its construction. The work was frequently inspected at different intervals by both the Executive and Superintending Engineers, and as the granite stone made use of in the flooring were dressed and fitted into position on the high ground at the end of the weir several months before actual construction, there was no cause for slurring over of this portion of the work. The stones when so fitted were, if I remember right, also inspected by the Chief Engineer for Irrigation, who at the time suggested the use of the granite stone chips for the concrete, and accordingly these chips were subsequently made use of in the concrete used in filling in the piers and abutments, as there was not enough of it for use under the granite flooring. The work was inspected by the Chief Engineer for Irrigation a month or two after completion, and any defective workmanship in the granite stone flooring would have at once been detected by that officer, whose inspections are invariably of a most searching nature.

I imagine that the core of the old work on which the concrete floor of the new building was founded gave, and that this caused the failure of the ashlar flooring; but as I have not seen the work after it was damaged, I am unable to say so for a certainty.

In conclusion I beg to be pardoned for the delay in offering this explanation, as the Superintending Engineer's letter, No. 412 T.C. of the 1st instant, stating that he was not prepared to recommend my going to Madras, reached me so late as last Sunday evening, the 14th instant, since when I have been busily engaged in making long marches and in taking over charge of the two sub-divisions from Sub-Engineer Syed Yusuf Saheb.

No. 15-B. From Major H. M. VIBART, R.E., Officiating Superintending Engineer, Third Circle, to the Chief Engineer for Irrigation, dated Chepauk, 21st October 1879, No. 6,202.

WITH reference to your memorandum No. III-41 C.N., dated 5th August 1879, I have the honor to forward copy of letter No. 469, dated 14th October 1879, received from Captain A. C. Smith, R.E., Executive Engineer, on the subject, and to observe that it appears that that officer is unable to throw any light on the question as to who is responsible for the design referred to, nor to ascertain who were the members of the Committee who were said to have approved of the design.

From Captain A. C. SMITH, R.E., Executive Engineer, Cuddalore Division, South Arcot, to the Superintending Engineer, Third Circle, dated Cuddalore, 14th October 1879, No. 469.

I HAVE the honor to reply to your No 4,707, of 13th August 1879, on Chief Engineer's No. III-41 C.N. of 5th idem, regarding shutter gear Red Hills dam vent as follows :—

(1.) I only received (from the Executive Engineer, Chingleput,) the records bearing on the case on 12th instant.

(2.) Owing to extra work here I have not thought it right to proceed to the Mount for the purpose of hunting up the records there, but I have no doubt all available papers have been sent me, not only from the late Range Office but also from the District Office.

(3.) The orders of the Chief Engineer, to ascertain who was responsible for the design, were peremptory, so I called for all papers connected with the case both from the Range Office and Superintending Engineer's Office, but, though all these have been forwarded to me, there is nothing to show how Mr. Grainger's design came to be executed in the Workshops

(4.) Colonel Moberly most distinctly states, *vide* his No. 1,030, of 15th June 1875, that the design was approved by a Committee appointed to examine the subject, but I am quite unable to answer the Chief Engineer's first question as to who was "responsible for the design" and "if it was considered by a Committee," but although this is the first I have heard or remember having heard of a Committee, as Colonel Moberly states that such a Committee was appointed, I should say that doubtless such was the case, though I can find nothing on record as to its meeting nor the results thereof.

(5.) For similar reasons, I cannot state on what data the design was prepared. Several designs and much correspondence passed between myself and Mr. Grainger on the matter, but all my designs were altered, and of this I complained somewhat in my No. 480, of May 1875, and distinctly reported that a design was then being prepared in the Public Works Workshops; the results of all my correspondence with Mr. Grainger were reported by me to Colonel Moberly.

(6.) Neither can I throw any further light on the third question raised by the Chief Engineer, as to whom the design was submitted to for approval. In my last letter, No. 936 of 17th July 1875, forwarding the estimate for sanction, I stated that no plans were forwarded for the gear from the Public Works Workshops, and thus left the matter in the hands of the Superintending Engineer.

(7.) I heard nothing further on the matter until receipt of the G.O., No. 2,322, of 11th August 1875, sanctioning the work. In paragraph 4 of the Chief Engineer's memorandum, No. 867, therewith, it is recommended that the Superintending Engineer should be authorised to "prepare the cut stone work and order the sluice gear," as though some particular plan had been forwarded, and there was nothing to show that such was not the case. This Government Order was sent for my information and guidance by Superintending Engineer on 30th August 1875, and on 29th February I applied to the Public Works Workshops for a tracing of the shutters, &c., as "being actually constructed," in order that there might be no mistake in constructing the masonry to fit.

(8.) I believe all correspondence between myself and the Public Works Workshops on the matter has already been forwarded to the Chief Engineer by Colonel O'Connell, and resulted in memorandum No. 68-C.N., of 24th August 1878, by the Acting Chief Engineer for Irrigation.

(9.) In conclusion I regret that I am unable to throw any further light on the matter.

SUBMITTED to Government with reference to paragraph 3 of G.O., No. 374 I., of 1st July 1879.

2. With the first of these letters the Superintending Engineer transmitted a memorandum by Captain A. C. Smith, the Executive Engineer of the Mount Range, at the time the 10-vent sluices in the surplus weir of the Red Hills Tank were constructed, showing the arrangements made by him for the execution of the work. Captain Smith's personal knowledge extends to the time when the construction had been completed up to beam stone level, and as the failure of the sluices, as regards masonry, occurred in the flooring, his responsibility covers the period concerned.

Captain Smith states that, as regards the composition of the concrete, there are no written orders in existence and probably no specific orders were given; but verbal orders were issued, and he knows were carried out, to make the concrete in the same way as that used at the anicut at Tamarapak. Of this latter concrete it is stated that a basket "placed in a quiet pool in the river set hard in thirty-six hours, and required a crowbar to break its mass."

That there was no resemblance between the concrete thus described and that used for the floor of the sluices is sufficiently evident, for Major Wood, in paragraphs 4 and 5 of his letter No. 3,098, at page 5 of Proceedings, Madras Government, No. 374 I., of 1st July 1879, says:—"The sluice floors consisted of a course of ashlar masonry 12 inches thick, resting on from 9 to 12 inches of what was evidently designed to be concrete. This again rested on the laterite masonry of the old calingulah of the Red Hills Tank, the surface of which appears to have been plastered before the concrete was put on. The concrete was, however, nothing more than a tolerably compact layer of laterite gravel, with probably an intermixture of sand and soorki. Whatever lime may originally have been contained in combination with the materials just specified had been entirely melted or washed out. The plaster mentioned as underlying the concrete I found to be in a soft state."

Captain Smith, in endeavouring to account for the failure of the concrete, supposes that the latter may have been over-rammed, thus breaking the nodules of gravel and exposing a soft and soluble interior; also that some chemical action may have resulted when the lime was brought in contact with the clay and iron of the laterite gravel. Laterite gravel, when properly selected, makes excellent concrete, and at any rate no action of the lime thereon has elsewhere been noticed. Gravel containing much clay may have been used, and if so the clay may have prevented the formation of a solid and reliable foundation. In that case the work was not properly done, and it was not laterite gravel, but the inferior material used which occasioned the failure. This, however, would not account for the lime in the plaster not having set: that must have been due to a proper mixture of lime and burnt clay not having been used.

3. Mr. Watkins was the subordinate in immediate executive charge of the work, and his explanations have been obtained through the Superintending Engineer, Fifth Circle. The materials used for the concrete are given as stated by Captain Smith, and Mr. Watkins mentions that laterite was used for the concrete at Tamarapak which set so well. Mr. Watkins' letter throws no light on the failure of the sluices. He supposes that the old laterite masonry of the former calingulah on which the sluices were built must have given way, but such was not the case, as of course it would have been unnecessary to seek for explanation had the foundations of the old masonry failed. All the masonry of the weir appears to be founded on laterite, which is not at all likely to yield.

4. The sluice floors failed because the concrete under the ashlar masonry was for some reason bad, and unsuited to the duty it had to perform. The probability is

that the lime did not set, but so far as responsibility for the failure is concerned, it is immaterial to what cause the badness of the concrete was due. It was the duty of Captain A. C. Smith as Executive Engineer to satisfy himself that the work was in all respects thoroughly good; that the proportions of lime and soorki were suitable, taking the lime and the soorki as supplied for the sluices, and not merely taking for granted that they were the same as the similar materials used at Tamarapak; also that the laterite gravel was of a kind adapted to the making of good concrete. The history of this work shows that it is one of those not uncommon cases in which failure results from the omission to examine into and settle details thoroughly. Results obtained at Tamarapak were a good guide to the determination of proportions at the sluices, but it was wrong to follow this guide without taking the precaution to see whether the conditions were alike. In June and July 1876 Captain Smith, when he was at the work, should have made sure that the concrete was really thoroughly good.

5. Not only did the masonry of the sluices fail, the shutter gear was likewise a failure and to an extent even more complete. The attempt to ascertain how gear so unsuitable, in at any rate the details of the arrangements, came to be designed, approved or accepted and set up, has not been successful, though it might have been expected that the records would have shown the course which matters took, especially as a Committee was mentioned as having been nominated to consider the matter. Captain Smith's letter affords no additional information, and that obtained from papers sent to this office, which will be found noticed in the memorandum as per margin,* indicates only that Colonel F. Moberly's, the then Superintending Engineer, attention was specially drawn to the requirements, which clearly were left unprovided for. The gear which was referred to as likely to be suitable was fully tested† at the Workshops at Chepauk, it had been in use at the head sluices of the supply channel of the Red Hills Tank; it had been used also at some of the irrigation sluices, though it was much more powerful than was at all necessary for these. How for a position in which much greater power and stiffness were needed, weaker and slighter gear was provided and accepted without protest is almost inexplicable. Had Mr. Grainger, the Superintendent of the Public Works Workshops, been told to make the gear as designed, he ought, if furnished with a drawing showing the circumstances of the sluices, to have at once seen that it would not be capable of doing the work required; but he would not seem to have had much to do with the design, and he could not have tested the first set made up in the way in which that made for the head sluice of the supply channel, Red Hills Tank, was tested, or the weakness would have been detected. Neither Colonel F. Moberly nor Mr. Grainger being in India it would be useless to pursue the inquiry further.

With Superintending Engineer's No. 6,202.

* No. 41-C.N., 5th August 1879, appended.

† Particularly with regard to adequacy for closing sluices.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

No. 16. ORDER THEREON, 6th December 1879, No. 715 I.

HIS GRACE the Governor in Council is of opinion that it was Captain A. C. Smith's duty to have seen that the construction of the surplus sluices in the waste weir of the Red Hills Tank, a work of great importance, was thoroughly well done with good materials and good work; that the failure of the sluices has arisen from the badness of the concrete foundation on which the floor stones were laid, and that for this Captain A. C. Smith is responsible.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following papers:—

No. 17. Endorsement of the Chief Engineer for Irrigation, dated Chepauk, 25th November 1879, No. 318 I.

Telegram from the Superintending Engineer, First Circle, Rajahmundry, to the Chief Engineer for Irrigation, Madras, dated 24th November 1879.

CYCLONE 19th instant. Extensive breaches in Commamur Canal. Navigation stopped.

SUBMITTED for the information of Government.

2. The Commamur Canal will continue to be liable to suffer extensive damage until the cross drainage works are made adequate. The injuries now reported are a repetition of those which occurred in the cyclone of May 1877, when the damage done was estimated to cost about Rs. 20,000 to repair, but the expenditure, as shown in the Progress Reports, was considerably less.

Proceedings, Madras Government, No. 124 I., dated 29th June 1877.

3. The Government of India have lately accorded provisional sanction to a part of the completion estimate of the Commamur Canal, and the undersigned has repeatedly drawn attention to this matter of the cross drainage arrangements, their improvement being essential to the safety and efficiency of the canal. In Schedule A of the Budget provision* was made as far as seemed at the time practicable for work of this description, but circumstances, as detailed in Proceedings of Madras Government, of the 17th October last, prevented the instructions given to the Superintending Engineer being acted upon, and Government directed a different distribution of the grant to be made.

Paragraph 2 of Note in Procs. of Madras Govt., No. 257 I., dated 23rd April 1879.
Paragraph 7 of Note in Procs. of Madras Govt., No. 621 I., dated 17th October 1879.

* Rs. 7,365.

4. Until upland drainage can be passed across the canal as fast as it comes down, there will be a certainty of repeated damage to the canal banks; and, in cyclones, of such damage being extensive, because the water being ponded up behind the right bank the waves increase the mischief very greatly.

5. The Superintending Engineer should, it is considered, arrange to have as many of the outlets constructed before the end of the current official year as may be possible. To do this material must be collected at once, or as soon as boats can again work on the canal. As much money as the Executive Engineer may be able to spend will be forthcoming as soon as the surrender and demand statements are received. Probably the money which will now have to be spent in repairing damage would have sufficed to provide all the more important outlets, and there is no expenditure so entirely unsatisfactory as that required for the repair of preventable damage.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

No. 17-A. Telegram from the Executive Engineer, Duggirala, through Guntúr, to the Chief Engineer for Irrigation, Madras, dated 26th November 1879.

TRAFFIC Commamur Canal resumed with difficulty.

No. 18. ORDER THEREON, 9th December 1879, No. 716 I.

HIS GRACE the Governor in Council regrets to learn that the Commamur Canal has again, as in 1877, suffered much damage during a cyclonic storm which occurred

on the 19th November; the absence of adequate means of passing upland drainage being the cause. The Superintending Engineer will arrange at once for the commencement and completion without delay of all the principal outlets for cross drainage, and he will report with as little delay as possible what additional funds will be needed for expenditure within the current official year.

2. The cost of repairing the damage reported in the foregoing papers should be ascertained and reported in due course.

3. The Government desire to know the exact present condition of the Santaravur lock, the foundations of which were being laid in May 1877, two and a half years since.

(Signed) JOHN MULLINS, Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Read the following paper :—

No. 19. Endorsement of the Chief Engineer for Irrigation, dated Camp at Poodoochuttrum, 3rd December 1879, No. 323 I.

From Lieutenant-Colonel H. L. PRENDERGAST, R.E., Superintending Engineer, Second Circle, to the Chief Engineer for Irrigation, dated Bellary, 29th November 1879, No. 3,608.

I HAVE the honor to report that I have received information from the Executive Officers of the Nellore and Guntúr-Ongole Divisions, reporting that a violent storm occurred on the 19th instant; that slight rain came on during the 18th and increased during the night, till it fell with great force, accompanied by a gale of wind, from noon till 4 P.M. on the 19th, and then subsided by about 6 P.M. Upwards of 5 inches of rain fell at Nellore, and 7·6 inches were registered at Kávali. Much damage was done to houses and trees and to irrigation works.

2. From the reports received up to date the following tanks have been breached :—

In the Pennèr Delta.

Kudithipaliem large tank	A breach of 30 yards.
Gangapatam tank	Do. of 50 „
Potlapudi tank	Ring-bunds have been thrown up.
Venkanapalem tank	Ring-bunds have been thrown up.
Papireddipaliem tank	Slight breach at end of bund.
Chinnacherukur tank	Two breaches not large.

South Nellore Taluk, beyond the Delta.

Two tanks breached.

North Nellore Taluk.

Four tanks breached.

The tanks in the delta were considerably more than half full before the storm came on, and the breaches are attributed to the force of the wind raising the water over the banks.

3. In the Ongole Division of the district the trunk road is seriously damaged between the Palar River in the Ongole Taluk and Kávali. All the tanks are said to have been filled before the height of the storm. The Tahsildars were written to at once to direct the villagers to throw up ring-bunds and save water as far as possible. The Kávali Taluk Tahsildar reported, on the 20th, to the Collector that he had issued strict orders to this effect to the village authorities. Supervisor Mr. Laskey reports that five tanks are damaged in the Kávali Taluk, twenty-four tanks in the Kandukúr Taluk, and ten tanks in the Ongole Taluk. The Tahsildar of Kávali wrote to the Collector that eleven tanks had breached, from what he had heard on the 20th.

4. Emergent work is being carried out, and estimates will follow in the usual course. The extent of injury to irrigation works and the cost of restoration will be reported hereafter. Other reports may still come in of tanks being damaged, while some of the tanks named may have suffered but little. The devastation by the storm appears to have taken place along the sea coast, between the Nellore and Ongole Taluks. No damage is reported as yet to have been done in any of the inland taluks; and none is reported from the Guntúr District.

SUBMITTED for the information of Government.

2. The Superintending Engineer has been requested to ascertain whether the tanks reported to be breached were provided with adequate surplus weirs.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

No. 20. ORDER THEREON, 9th December 1879, No. 717 I.

RECORDED, pending the receipt of the further information required to show whether the requirements of the tanks, as regards disposal of surplus, had been duly attended to.

(Signed) JOHN MULLINS, Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following papers:—

No. 21. Endorsement of the Chief Engineer for Irrigation, dated 6th December 1879, No. 326 I.

Proceedings of the Madras Government, Revenue Department, dated 14th August 1879, No. 1,696.

No. 21-A. From C. J. CROSTHWAITE, Esq., Acting Collector of Kurnool, to the Chief Engineer for Irrigation, dated Kurnool, 8th November 1879, No. 373.

IN reply to your letter, dated 31st ultimo, No. 26 K.R., I have the honor to inform you that the amount of water-rate payable to the Madras Irrigation and Canal Company for the total area of dry crops irrigated by canal water in Fasli 1286, as shown in G.O., No. 1,696, Revenue Department, dated 14th August last, is included in the sum of Rs. 1,97,976-12-9 exhibited in the last column of the demand statement embodied in G.O., No. 892 I., of 6th November 1878, Public Works Department.

No. 21-B. From S. T. McCARTHY, Esq., Acting Collector of Cuddapah, to the Chief Engineer for Irrigation, dated Cuddapah, 10th November 1879, No. 3,233.

IN reply to your letter No. 35 C.D., of 31st October 1879, I have the honor to state that the amount of water-rate payable to the Madras Irrigation and Canal Company for the total area of dry crops irrigated by canal water in Fasli 1286 was included in the E Returns printed with G.O., No. 18 I., of 8th January 1878.

SUBMITTED to Government, with reference to G.O., Revenue Department, No. 1,696, of 14th August 1879.

2. The amount of water-rate payable by Government for dry crops irrigated by the Madras Irrigation and Canal Company's Canal during 1876-77 under the special arrangements sanctioned in G.O., Revenue Department, No. 1,329, dated 23rd October 1876 was, it will be seen, included in the form E Returns* and placed to the Company's credit. The effect of the order of August last in the Revenue Department is therefore merely to authorise credit being given to collections in the accounts.

* Printed in G.O., No. 892 I., of 6th Nov. 1878.
" " " " 18 I., of 8th Jan. "

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

No. 22. ORDER THEREON, 12th December 1879, No. 720 I.

COMMUNICATED to the officers concerned.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Read the following papers :—

No. 23.	To Suptg. Engineer, Kistna,	dated 30th Sept. 1878, No.	79 K.S.
No. 23-A.	From " " First Circle,	" 23rd June 1879, "	512 K.S.
No. 23-B.	To " " "	" 5th July " "	35 K.S.
No. 23-C.	To Examiner, P.W. Accounts,	" 8th " " "	121 C.
No. 23-D.	From " " "	" 17th " " "	11 E.I.
No. 23-E.	From Suptg. Engineer, First Circle,	" 14th Oct. " "	1,138 K.S.

No. 302 I.

No. 23-F. *Note by the Chief Engineer for Irrigation.*

ON looking over the Progress Report of Famine Relief Works, Kistna District, for July 1878, it was observed that the expenditure shown against the Romperu Drain to the end of 1877-78 was upwards of half a lakh of rupees, and a report was called for on the following points :—

1st. The normal value of work done.

2nd. Particulars of work done and the results.

3rd. If any part of the work had been left incomplete and ineffective what was required to secure the benefit of the outlay already incurred.

2. The reply showed that (1) the value of work done was Rs. 3,292, (2) that what had been done being in detached lengths had produced no benefit, and from the last communication it appears that, (3), no moderate outlay would have any material beneficial effect. Under these circumstances nothing should be done until the completion estimates are sanctioned.

3. The causes of the vast difference between expenditure and work turned out are briefly :—

(1) Want of tools.
(2) Freshes in the Romperu.
(3) Difficulties with the famine coolies.

Mr. Mitford Smith is the only officer now in the delta who was connected with the work, and he is able to afford but little information on the subject. It appears

from his letter No. 358, of the 20th August last, that for some 11,500 coolies there were, early in August 1877, 292 mamoties, 140 crowbars, and 1,500 baskets, or about enough for, say, 2,000 people.

4. The circumstances under which the famine labour came to this part of the Western Delta for employment are noticed in the reports printed in the undermentioned Proceedings of Madras Government—

Revenue Department, F.R.,	dated	21st	August	1877,	No.	2,549 A.
Mis.	,,	29th	,,	,,	,,	47 I.
Revenue Department, F.R.,	,,	25th	,,	,,	,,	2,575 B.
Mis.	,,	18th	Sept.	,,	,,	140 W.
Revenue Department, F.R.,	,,	25th	,,	,,	,,	2,951.
Mis.	,,	9th	October	,,	,,	943 W.
	,,	26th	Sept.	,,	,,	786 W.

In G.O., No. 197 I., of the 31st July 1877, preparations were ordered to be made for the employment of large gangs in the delta, and complete instructions were given. Unfortunately, as the event proved, this order was issued two or three months too late. Steps were also taken to strengthen the executive establishment, but it would seem that the influx of famine labour was sudden, and that before any organised arrangements could be made a great expense for feeding and hutting the coolies had been incurred. Very soon after the labour had settled down to work, freshes in the Romperu put a stop to the operations.

FORT ST. GEORGE, (Signed) JOHN MULLINS, Col., R.E.,
29th October 1879. Chief Engineer for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 24. ORDER THEREON, 13th December 1879, No. 721 I.

RECORDED with the remark that want of tools cannot, His Grace the Governor in Council considers, be accepted as an excuse for the disproportion between work done and expenditure incurred, seeing that relief operations had been in operation in the Kistna Delta from the latter part of 1876, and it is shown from the Superintending Engineer's letter, printed in Proceedings of Madras Government, No. 3,553, of the 27th December 1876, that the necessity for having tools in readiness had been recognised, that considerable numbers were at that time available, and that the manufacture of large numbers in addition was in progress. Consequently the want of tools on the Romperu Drain must have been due to faulty arrangements which, if unavoidable on the first arrival of coolies, ought to have been set right within a very few days.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following paper :—

No. 25. From J. W. RUNDALL, Esq., Acting Superintending Engineer, Fifth Circle, Trichinopoly, to the Chief Engineer for Irrigation, dated 13th October 1879, No. 546 T.C.

WITH reference to G.O., No. 155 I., of the 7th March 1879, I have the honor to state that the sums realised by sale of grass in the Tirumalavadi Padugay from September 1875 (date of institution of the suit) to January 1879 (date of restoration of the Padugay to the plaintiffs) amount to Rs. 3,394.

2. On the 12th May I informed the Government Pleader that this was the amount received, and asked him to move the Court to determine whether this sum represented the mesne profits, which according to the decree were to be paid.

3. I heard nothing whatever from the Government Pleader in answer to this, so last month I requested information as to whether the sum had been determined by the Court. In reply the Government Pleader informed me that Rs. 1,900 had been claimed by one of the plaintiffs for that part of the Padugay attached to Trichinopoly District, but that the Court had taken no action, as the plaintiff had not paid the stamp duty. The Government Pleader at the same time informed me that a defendant could not move a Court to determine the amount.

4. I need hardly say that the Government Pleader should have given me this information when I asked him in May last to move the Court to determine the sum to be paid.

5. In addition to the sum received from grass sales in the disputed Padugay, the sum of Rs. 30 was decreed by the Court to be paid as the value of nanel grass removed. The total sum to be paid into Court is therefore Rs. 3,424.

6. Out of the sums received Rs. 229 were realised and credited in the accounts of the Trichinopoly Division, and Rs. 3,165 in the accounts of Tanjore.

7. The Pleader has in his letter of the 29th ultimo recommended my paying into Court the sum of Rs. 229, which we have received in Trichinopoly, in satisfaction of the claim of Rs. 1,900 advanced by the plaintiffs, also that the Rs. 30 should be paid at once. The Pleader informs me at the same time that if the sum we admit to be due is not paid before the petition claiming Rs. 1,900 is heard, the Court might decree the costs on this petition against us.

8. I have under these circumstances remitted the money, Rs. 259, and requested the Executive Engineer, Trichinopoly Division, to debit the amount under Miscellaneous Advances pending your instructions as to the proper debit. I trust my action may be approved.

9. I have received notice that Rs. 8,290 is claimed by the plaintiffs as mesne profits in the portion of the Padugay belonging to Tanjore, but the Pleader informs me that no petition has as yet been filed in the Court claiming this sum. As it is necessary that I should be authorized to pay the sum received in Tanjore into Court, I request the requisite sanction may be given, also instructions regarding the debit.

10. The Government Pleader has also applied for his fee for defending the two suits, and for his expenses for stamps, &c., the latter amount to Rs. 30-4-8 in both suits. As regards his fee, the Pleader states that he has had a considerable amount of work in connection with both suits. I applied to the Collector to know the amount of fee usually paid, and he informed me that 5 per cent. on the amount involved is the ordinary fee. I conclude this will be held by the Court to amount to the sum above proposed to be paid in, viz., Rs. 3,424, and I would therefore solicit authority to pay the Pleader Rs. 170.

11. The total sanction required is therefore—

	RS.
Amount to be paid into Court	3,424
Costs paid by Pleader	31
Pleader's fee	170
	3,625

of which Rs. 3,165 should be debited to the Tanjore District.

No. 26. ORDER THEREON, 13th December 1879, No. 722 I.

THE Superintending Engineer, Fifth Circle, is authorized to pay the amounts referred to in paragraph 11 of the foregoing letter.

2. The Examiner of Public Works Accounts will instruct the officers concerned as to the head of account to which the amounts are chargeable, and determine the manner in which appropriations to cover the charges are to be made.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Read the following paper :—

No. 27. Endorsement of the Chief Engineer for Irrigation, dated Camp at Tanjore, 5th December 1879, No. 324 I.

From Lieutenant-Colonel W. CHRYSTIE, R.E., Superintending Engineer, First Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 12th November 1879, No. 1,786 G.D.

I HAVE the honor to explain that the differences between the amounts of rent due and those collected for the several boats entered in the statement for 1878-79, noticed in your No. 1-67 G.D., of the 9th August, were mainly caused by the omission of the sums still due for rent from the column of remarks, as ordered in the concluding clause of paragraph 5 of your No. 101 G.D., of the 18th June 1878.

2. From the accompanying figured statement received from the Executive Engineer, Eastern and Central Delta, Godávari District, you will perceive that the statement did require correction. The earnings of No. 1 boat, as entered, were too small by Rs. 56-0-3, whilst for boat No. 4 the balances of the previous year was given as Rs. 89-3-2 instead of Rs. 78-12-10, and the earnings of current year (last) as Rs. 198-7-6 instead of Rs. 208-13-10. The other corrections are very small.

3. A correct statement is forwarded herewith.

4. Mr. Walch now arranges that the boat rents are collected when they become due.

REVISED Memorandum showing the Rents realised on Range Boats in the Godávari District during the official year 1878-79.

Number of Boat in Statement.	Particulars of Rents realised.	Amount.	Total.	Remarks.
		RS. A. P.	RS. A. P.	
1	For two days in June 1876, for January 1877, from March 1878 to 26th November 1878, from 4th to 18th January, from 27th January to 3rd February, and from 10th February to 28th March 1879 ..	193 3 2	193 3 2	Amount due by Officers .. RS. A. P. 101 9 10
2	From 23rd to 24th January 1878, and from 27th to 29th and 31st January 1878; from 1st to 3rd February 1878, and from 11th April 1878 to 31st January 1879, for 5th and from 21st February to 4th and from 16th to 25th March 1879	242 0 3	242 0 3	Do. .. 15 13 0
3	Arrears	1 8 8		
	From 24th to 30th January and from 1st to 7th February 1878, and from 5th to 19th and from 20th to 30th April 1878, and from 1st May to 24th December and from 27th to 29th December 1878, and from 4th to 18th January 1879, from 1st to 9th, from 11th to 16th and from 20th to 27th February 1879, from 28th February to 5th March 1879, from 7th to 10th and from 16th to 31st March 1879 ..	227 10 6	229 3 2	Do. .. 4 11

This Return excludes the rents realised on account of Workshop Range Boat.

REVISED Memorandum showing the Rents realised on Range Boats in the Godávari District during the official year 1878-79—*cont.*

Number of Boat in Statement.	Particulars of Rents realised.	Amount.	Total.	Remarks.
		RS. A. P.	RS. A. P.	RS. A. P.
4	Arrears	78 12 10		
	From 1st March to 3rd July 1878, from 19th September to 25th December 1878, from 10th to 21st January, for 2nd, 3rd, from 4th to 6th, from 17th to 24th February and from 1st to 3rd, 8th to 15th, for 21st and from 24th to 28th March 1879 ..	37 3 10	116 0 8	Amount due by Officers .. 171 10 0
5	Arrears	8 6 2		
	From 4th April to 27th June 1878, and from 25th August 1878 to 15th January, and from 25th January to March 1879	139 12 4	148 12 6	Do. .. 16 0 0
6	Sale proceeds of boat sold by auction	96 10 0	96 10 0	
7	From 17th April 1878 to 31st March 1879	167 7 5	167 7 5	
8	Sale proceeds of boat sold by auction	70 0 0	70 0 0	
9	Arrears	9 8 10		
	From 27th May to 22nd December 1878, and from 30th to 31st January 1879, and for February 1879.	63 7 9	73 0 7	
10	From 7th July to 23rd August 1878, from 4th to 31st December 1878, and from 1st to 19th January and from 1st to 31st March 1879	20 4 9	20 4 9	Do. .. 13 2 7
11	From 25th November 1878 to 31st December 1878, and from 1st January to 15th February and from 17th February to 20th March and from 24th to 31st March 1879	43 3 2	43 3 2	Do. .. 103 3 8
12	From 20th January to 10th February and from 19th February to 31st March 1879	6 12 6	6 12 6	Do. .. 26 13 9
	Total ..	..	1,405 15 11	

This Return excludes the rents realised on account of Workshop Range Boat.

DOWLAISHWERAM,
12th November 1879.

(Signed) B. H. YOUNG, Asst. Engineer,
Asst. to Suptg. Engr., First Circle.

STATEMENT showing the date of completion, earnings, &c., of Range Boats constructed, purchased, &c., in the Godávari District, prepared agreeably to G.O., No. 1,749, dated 7th July 1873, for 1878-79.

Boat.		Date of Completion or Purchase and Cost.		Monthly rent.	Amount received up to end of March 1879 (actual collections).	Amount spent on Repairs up to end of March 1879.	Amount reserved for Repairs and Reconstructions up to end of March 1879.	Remarks.
No.	Name of Boat or Officer using it.	Year.	Cost. Amount.					
			RS.	RS.	RS. A. P.	RS. A. P.	RS. A. P.	
8	2nd class Range Boat.	1870-71.	400	16	* 626 11 9	786 2 8	159 6 11	Sold. *Vide* G.O. No. 155 I., dated 25th February 1878. For particulars see Appendix. * Includes Rs. 70, being the amount of sale proceeds.
6	Do. do.	1869-70.	800	16	†1,511 6 9	526 15 11	984 6 10	Sold. *Vide* G.O. No. 241 I., dated 22nd March 1878. For particulars see Appendix. †Includes Rs. 96-10-0, being the amount of sale proceeds.

STATEMENT showing the date of completion, earnings, &c., of Range Boats constructed, purchased, &c., in the Godávari District, prepared agreeably to G.O., No. 1,749, dated 7th July 1873, for 1878-79—*cont.*

Boat. No.	Boat. Name of Boat or Officer using it.	Date of Completion or Purchase and Cost. Year.	Date of Completion or Purchase and Cost. Cost. Amount.	Monthly rent.	Amount received up to end of March 1879 (actual collections).	Amount spent on Repairs up to end of March 1879.	Amount reserved for Repairs and Reconstructions up to end of March 1879.	Remarks.
			RS.	RS.	RS. A. P.	RS. A. P.	RS. A. P.	
1	G. D. Wybrow, Esq., Executive Engineer, from 10th February 1879.	1872-73.	1,557	24	1,513 14 7	622 9 7	891 5 0	
2	Lieutenant L. Langley, R.E., Assistant Engineer, up to end of January 1879.	1870-71.	900	24	1,945 1 3	905 13 4	1,039 3 11	
3	Lieutenant A. R. F. Dorward, R.E., Assistant Engineer, up to 24th December 1878.	1868-69.	1,200	24	2,352 2 5	1,328 3 9	1,023 14 8	
4	Different officers ..	1869-79.	1,200	24	1,601 12 9	1,067 12 4	534 0 5	
5	Sergeant E. Cope, Taluk Overseer, from 25th January 1879.	1870-71.	783	16	708 0 4	639 10 2	68 6 2	
7	Sergeant D. Mackintosh, R.E., Taluk Overseer.	1869-70.	800	16	960 6 7	868 9 7	91 13 0	
9	Mr. J. Mahony, Taluk Overseer.	1868-69.	400	8	586 11 7	445 6 5	141 5 2	
10	Different officers ..	1869-70.	400	8	521 10 2	472 10 2	49 0 0	
11	G. T. Walch, Esq., Acting Superintending Engineer, First Circle.	1878-79.	1,780	36	43 3 2	..	43 3 2	New boat built under sanction accorded in G.O., No. 159 I., of 28th Feb. 1878.
12	H. S. Taylor, Esq., Assistant Engineer.	1878-79.	820	16	6 12 3	..	6 12 3	Do. do. No. 241 I., of 22nd March 1878.
	Total ..	..	9,840	..	10,239 11 1	6,350 11 4	3,888 15 9	
No.	Boats sold.			—	Surplus.	Deficient.		
				RS.	RS. A. P.	RS. A. P.		
..	Boat (G.O., No. 531, dated 2nd March 1874,) balance.			..	..	164 3 0		
6	2nd class Range Boat (G.O., No. 241 I., of 22nd March 1878,) balance.			..	184 6 10	..		
8	2nd class Range Boat (G.O., No. 155 I., of 25th February 1878,) balance.			..	..	559 6 11		
				..	184 6 10	723 9 11		
				..	..	184 6 10		
	Deduct deficient ..			..	..	..	539 3 1	
	Net balance available for repairs, &c., Total.			..	..	..	3,349 12 8	

DOWLAISHWERAM,
19th July 1879.

(Signed) G. P. CARLESS, Asst. Engr.,
Asst. to Suptg. Engr., First Circle.

APPENDIX.

Particulars of adjustment of Account of the following Boat sold under the orders of Government.

Boat No. 6, *G.O., No.* 241 *I., of* 22*nd March* 1878.

		RS. A. P.
Total receipts up to end of March 1878		1,414 12 9
Hire realised in 1878-79		...
Sale proceeds		96 10 0
Total ...		1,511 6 9
	RS. A. P.	
Expenditure on boat	526 15 11	
Cost of boat (original value)	800 0 0	
		1,326 15 11
Net profit ...		184 6 10

Boat No. 8, *G.O., No.* 155 *I., dated* 25*th February* 1878.

	RS.	A.	P.	RS.	A.	P.
Total receipts up to end of March 1878...				556	11	9
Hire realised in 1878-79 ...				...		
Sale proceeds ...				70	0	0
Total ...				626	11	9
Expenditure on boat ...	786	2	8			
Cost of boat (original value) ...	400	0	0			
				1,186	2	8
Balance deficit ...				559	6	11

(Signed) G. P. CARLESS, Asst. Engr.,
Asst. to Suptg. Engr., First Circle.

SUBMITTED to Government.

These statements show that the earnings of the ten range boats of the Godávari Delta during the year 1878-79 amounted to Rs. 1,405-15-11, including the proceeds* of the sale of two boats sold under the orders of Government marginally† noted; the gross amount of earnings up to end of that year being Rs. 10,239-11-1. The balance available for repairs is Rs. 3,349-12-8, or about 34 per cent. of their value.

* Nos. 6 and 8, Rs. 166-10-0.
† G.O., No. 155 I., of 25th February 1878.
„ „ 241 I., of 22nd March „

2. The proportion, which this balance bears to the cost of the boats, calculated on the principle laid down in paragraph 2 of the Note printed in Proceedings of Madras Government, No. 662 I., of 26th August 1878, is given below :—

	Balances. Required.	Actual.
No. 1 ...	779	891
„ 2 ...	600	1,039
„ 3 ...	1,000	1,024
„ 4 ...	900	534
„ 5 ...	522	68
„ 7 ...	600	92
„ 9 ...	333	141
„ 10 ...	300	49
„ 11 ...	...	43
„ 12 ...	...	7
	5,034	3,888

If the deficit on boats which have been sold be taken into account, the total actual balance becomes Rs. 3,350 only, and the impending loss Rs. 1,684.

3. These figures show that the balances entered against Boats Nos. 1, 2, and 3 are satisfactory, while the available balance in favor of Boat No. 4 is less than two-thirds of the standard amount required. The balances in favor of all the other boats, except the last two which have for the first time been brought on the returns, are so small that it is very doubtful whether they will be capable of being replaced when worn out. Unless it can be clearly shown that causes beyond the control of local management, such as boats being left unemployed owing to the withdrawal of officers from the delta, the replacement of a worn-out boat which has not sufficient funds to its credit will not be recommended for sanction.

4. On examining the statement of rents realised during the year, it was found that the amount of rent due for the period of occupation during the year differed materially from that actually realised. The statement had therefore to be returned to the Superintending Engineer, First Circle, who explains that the differences

pointed out are mainly due to the omission of the sums still due for rent from the column of remarks.

5. In the statement for the previous year 1877-78, printed with Proceedings of Madras Government, No. 662 I., of the 26th August 1878, Boat No. 5, value Rs. 783, is entered as having been built in 1872-73, while in the statement under review it is shown as having been built in 1870-71, or two years earlier. The alteration of date should have been explained by the Superintending Engineer.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

No. 28. Order thereon, 13th December 1879, No. 723 I.

Recorded with the remark that the financial results as shown in these papers are not satisfactory, and that unless better management be introduced the replacement of worn-out boats will be found impracticable.

2. Boat hire due must be realised immediately after the close of each month, and those using the boats should arrange for this being done when drawing their pay through the divisional office.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Establishment.

Read the following paper :—

No. 29. Endorsement of the Chief Engineer for Irrigation, dated Chepauk, 27th November 1879, No. 321 I.

From Lieutenant-Colonel W. CHRYSTIE, R.E., Superintending Engineer, First Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 12th November 1879, No. 1,780 G.D.

With reference to your memorandum No. 9 G.D., of 14th January 1878, I have the honor to forward, herewith, two comparative statements showing the differences between the original and revised estimates for constructing sluices on the right and left banks of the Injeram canal at 22nd mile, together with two revised designs showing the additional work proposed, and to request you will be good enough to obtain the sanction of Government to the revised estimates,* in lieu of those sanctioned in G.O., No. 2,186, of 19th August 1876.

	RS.
* Sluice, right bank	805
Do., left bank	820

2. The usual statement, showing total sanctions up to date, is herewith enclosed.

Submitted to Government, with a recommendation that sanction for the revised estimates for distribution sluices in right and left banks of Injeram canal at 22nd mile may be accorded.

2. It is unsatisfactory that an Overseer should have been allowed without check to build these sluices at levels which differed from those intended. Mr. R. S. Harris, the Sub-divisional officer at the time, is therefore primarily to blame. Fortunately the sills were placed lower than designed instead of higher, and so the error has not affected the efficiency of the sluices, but has perhaps increased it, for it appears that

the sills were to have been at four feet below F.S.L. in the canal, or some two feet above canal bed level, and unless there was some special reason for this arrangement the original design was faulty.

3. The excess involved in bringing the roadways to a safe level is for :—

	Original.	Revised.	Excess.
	RS.	RS.	RS.
Right bank head-sluice	620	805	185
Left bank do.	660	820	160

The sanction of the original estimates was confirmed in Proceedings of Madras Government, No. 2,186, 19th August 1876, the items being the second and last under Injeram canal.

4. The total sanction against the lump sum provision of Rs. 11,000 for distributaries will become Rs. 7,025.

(Signed) C. VINCENT,
for Chief Engineer for Irrigation.

No. 30. ORDER THEREON, 13th December 1879, No. 724 I.

THE revised estimates for the following distributaries, Injeram canal, Godávari Eastern Delta, are sanctioned. This sanction supersedes that confirmed in G.O., No. 2,186, dated 19th August 1876, and has been registered as No. 54 I., of 1879-80 :—

	RS.
Right bank head-sluice at 22nd mile	805
Left bank do. do.	820

(Signed) JOHN MULLINS, Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Read the following paper :—

No. 31. Telegram from the Superintending Engineer, Rajahmundry, to the Chief Engineer for Irrigation, Cuddapah, dated 24th November 1879.

NINE inches rain Bezwarra. Ellore canal badly breached and silted. Traffic stopped.

No. 31-A. ORDER THEREON, 15th December 1879, No. 726 I.

THE Superintending Engineer will be requested to report the number of accidents, involving interruption of traffic, which have occurred to the Kistna Ellore canal from 1875-76 inclusive ; the mileage at which the damage occurred ; the date and duration of the interruption in each case, and the cost of repairs. The information should be tabulated so as to show clearly the effect of inadequate cross drainage arrangements, and the parts of the canal which most frequently suffer from this inadequacy.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following paper :—

No. 328 I.

No. 32. *Note by the Chief Engineer for Irrigation.*

WITH reference to G.O., No. 656 I., dated 31st October 1879, it seems necessary to explain that owing to the delay which has unavoidably occurred in the preparation of the Preliminary Issue of the Budget, and in obtaining orders thereon, it has hitherto been found necessary to furnish the officers of the department with copies of the Preliminary Issue, in order to enable them to commence operations at the outset of the official year. Now that the forms in which the budget has to be submitted to the Government of India have been materially simplified, it is expected that it will be found practicable to print only a very few copies of this issue, and to publish the Final Issue at an earlier date.

2. Two months of the present year had elapsed when the orders of the Government of India were received in this office. Certain modifications in the allotments had prior to that time been found requisite, and were inserted in the Final Issue in order to render it as accurate a statement as possible. An increased grant of Rs. 30,000 for the Commamur canal, which was sanctioned by the Government of India prior to the issue of orders on the budget, was also incorporated for the same reason, although it did not find a place in those orders.

3. The figures adopted in paragraphs 5, 6, 20, and 22 of the budget orders of the Government of India are the same as those in the Preliminary Issue of the Budget, except that the grants for the Pelandorai Anicut System are transferred from Productive to Irrigation and Navigation works. They do not include the corrections suggested in paragraphs 9, 13, 16, 17, and 21 of the same orders. The corrections having been ordered to be made in the Final Issue, it was not practicable to carry them out without altering the figures.

4. It is not clear from the letter of the Government of India whether it is desired that the total grants in the Final Issue for Imperial Productive and Imperial Ordinary should correspond with those given in the orders, or whether the correspondence should extend to the totals under each budget head. One copy of the budget has been corrected in red ink in each of the above ways as far as the first estimate of charges is concerned.

5. Owing to the way in which the cost of the Establishment of the Chief Engineer for Irrigation is distributed, in addition to the percentage charge for share of General Establishment, any alterations made in the budget involve corresponding changes throughout. It is hoped that the alteration of the budget, as desired by the Government of India, will not be insisted upon, for this would necessitate a great deal of labour being expended in making a document which is now fairly useful quite useless, and further oblige the alterations made in one direction to be remade in the opposite direction immediately afterwards.

LOWER ANICUT,
10th December 1879.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 33. ORDER THEREON, 17th December 1879, No. 727 I.

ORDERED that the following letter be sent.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint. Secy. to Govt., P.W.D.,
Irrigation Branch.

No. 34. From the Joint Secretary to the Government of Fort St. George, Public Works Department, Irrigation Branch, to the Secretary to the Government of India, Public Works Department, Irrigation, dated 17th December 1879, No. 728 I.

SIR,—In reply to the Deputy Secretary's letter No. 143 A.I., dated 20th ultimo, I am directed to transmit a copy of the Proceedings of this Government as per margin, and with reference to the Note by the Chief Engineer for Irrigation to ask whether, under the circumstances therein set forth, the Government of India still desire the Final Issue of the Budget to be altered. It being doubtful what is the extent of the alterations directed in paragraph 2 of the letter under reply, a copy of the budget of which the first estimate of charges has been altered in each of two ways is transmitted.

No. 727 I, dated 17th December 1879.

Irrigation.
Account.

Read the following papers :—

No. 35. From Major-General A. FRASER, R.E., Secretary to the Government of India, Public Works Department, (Account—Irrigation,) to the Secretary to the Government of Madras, Public Works Department, Irrigation Branch, dated Simla, 20th November 1879, No. 169 A.—I.

THE revised estimate of the Irrigation Branch for 1879-80, communicated by your telegram dated 28th ultimo, shows the following differences by comparison with the Budget Estimate of the year :—

	Budget Estimate.	Revised Estimate.	Difference.
EXPENDITURE.	RS.	RS.	RS.
Imperial.—Working expenses of Productive Public Works	6,60,000	7,09,000	+ 49,000
RECEIPTS.			
Local	1,10,000	...	— 1,10,000

2. In respect to the contemplated excess of Rs. 49,000 over the Imperial grant, I am directed to state that measures should be at once taken to obviate the irregularity by due provision of funds, and that until this is ensured no excess outlay should be allowed.

3. The sum of Rs. 1,10,000 under Receipts Local is, I am to say, the estimate adopted on that account by the Government of India in the Department of Finance and Commerce. I am to request that you should at once place yourself in communication with the local Accountant-General, and arrange for the necessary entry on this account being made in the Regular Estimate of the Irrigation Branch due in this office on the 10th proximo, or furnish the Government of India with any explanation necessary to account for the divergence from the Budget Estimate.

No. 329 I.

No. 35-A. *Note by the Chief Engineer for Irrigation.*

THE amount provided in the Preliminary Issue of the current year's Budget for working expenses of Productive Public Works is Rs. 6,55,283. Of this sum Rs. 5,848 belong to the Pelandorai Anicut System, since transferred to Irrigation and Navigation works, leaving a balance of Rs. 6,49,435 for the five systems of Productive Public Works. If to this sum the grant of Rs. 12,000 for special Revenue investigations be added, as directed in paragraph 17 of the orders of the Government of India, printed in G.O., No. 383 I., of the 7th July 1879, the total amount provided for working expenses should be Rs. 6,61,435. It is not clear how the amount of Rs. 6,60,000 shown in the letter under reference has been arrived at.

2. The amount Rs. 6,61,435 has however, in carrying out the instructions of the Government of India, contained in paragraph 9 of their orders* on the Budget Estimate for 1879-80, been increased to Rs. 7,08,933† in the Final Issue, as explained in paragraph 4 of the Note printed with Proceedings of Madras Government, No. 460-C I., of 16th August 1879, and the latter amount was entered, as the Regular Estimate of the current year, in the telegram of the 28th October last. The ordinary grant as revised does not exceed the total grant sanctioned by the Government of India. There is therefore no irregularity to be obviated.

* *Vide* Procs. of Madras Govt., No. 383 I, of 7th July 1879.

† *Vide* page 2 of Procs. of Madras Govt., No. 460-C I., 16th August 1879.

3. Reference has been made to the Accountant-General on the subject of Local Receipts referred to in the last paragraph of the letter under reply.

LOWER ANICUT,
10th December 1879.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 36. ORDER THEREON, 17th December 1879, No. 729 I.

ORDERED that a copy of these Proceedings be forwarded to the Government of India in part reply to their Secretary's letter No. 169 A.—I. of 20th November 1879.

(True Extract.)

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

No. 37. (DOCKET No. 730 I., dated 17th December 1879.)

COPY forwarded.

(Signed) JOHN MULLINS, Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Read the following paper :—

No. 38. From Lieutenant-Colonel W. CHRYSTIE, R.E., Superintending Engineer, First Circle, to the Chief Engineer for Irrigation, dated Dowlaishweram, 3rd December 1879, No. 1,385 K.S.

I HAVE the honor to forward, for the information of Government, copy of a letter, No. 347, dated 21st instant, received from the officer in charge, Western Delta Division, Kistna, reporting the occurrence of a cyclone on the 19th and 20th November 1879, in his division.

From G. D. WYBROW, Esq., Executive Engineer, Kistna Western Delta Division, to the Superintending Engineer, First Circle, dated Chebrole, 21st November 1879, No. 347.

I REGRET to have to report of the occurrence of a terrible storm on the 19th and 20th instant.

2. The storm commenced at 8 A.M. on the 19th, with a strong wind and drifting rain, the wind increasing in violence at 2 P.M. and reaching its maximum force at about 7 P.M., after which a lull occurred for two or three hours, the storm recommencing about 10 P.M., with nearly its former violence, till 2-30 A.M. on the 20th, when the storm began to subside, and by 4 A.M. the storm had entirely ceased.

3. *Direction of the wind.*—The wind blew from N.N.W., gradually increasing round southward to S.S.E. at 8 P.M., and to S.W. at 11 P.M., and to due west by the morning of the 20th.

4. *Rainfall.*—The rainfall on the 19th must have been very heavy, but owing to the wind the rain gauge would show very much less than the actual rainfall. The rainfall as gauged at Jagerlamudy on the 19th was 6·25; Duggirala 4·30, and at Jutur 5·65.

5. *Damage by storm.*—As all tappal communication has been intercepted for the last two days, I have not been able to hear what actual damage has occurred, but I should fear it must have been extensive, judging from what I saw on the Commamur canal. This canal has been breached in a great number of places between the 24th and 29th miles. Many of the breaches are 100 yards in length. These breaches plainly show the want of an outlet for the Nakkavagu, as, at present, there are no means to pass this drainage across the canal. A few minor breaches have occurred between 24th mile and 19th mile at Kollumerla, but none of any consequence.

6. I was at Nullamada during the storm in my boat and made the best of my way up the canal, leaving the lower portion to be inspected by Mr. Garrett.

7. A detail report will follow when the full extent of the damage occasioned by the cyclone is known. The navigation of the Commamur canal will be stopped, but not for long, I hope, for as soon as the water goes down ring-bunds will be placed where practicable to close the breaches at once.

No. 39. ORDER THEREON, 20th December 1879, No. 737 I.

RECORDED in continuation of G.O., No. 716 I., dated 9th December 1879.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.
Account.

Read the following papers :—

No. 40. Proceedings of the Board of Revenue, dated 25th September 1879, Miscellaneous No. 8,943.

From J. F. PRICE, Esq., Collector of the Chingleput District, to the Acting Secretary to the Board of Revenue, dated Saidápet, 21st June 1879, No. 406.

GOVERNMENT have in G.O., Public Works Department, No. 919 I., dated 13th November last, recognized the necessity of deferring payment of compensation for lands taken up for Public Works until funds are allotted for the purpose; but Rule II of the instructions on the subject of payment of compensation contained in G.O., Public Works Department, dated 15th April 1875, No. 1,042, provides that in cases "in which land may have been taken up years ago and for which payment of compensation was deferred under former arrangements for want of funds, &c., payment may be made by Collectors as soon as they are satisfied of the correctness of the claims," bills being submitted on the day of payment or as soon after as possible.

2. The temporary Deputy Collector inquires whether the latter order is still in force or is to be considered as cancelled by the terms of the first-quoted Government Order, and I have therefore the honor to request the favor of the Board's instructions in the matter.

3. It seems to me, however, that there is no inconsistency between the two orders. The previous provision of funds is as necessary under the post-audit as under the pre-audit system, and I am therefore of opinion that the rule that payments may be made before audit in long-standing cases still holds good, subject of course to the condition that funds are available.

G.O., dated 24th November 1875, No. 2,479.
" " 21st April 1876, No. 529.
Board's Procs., dated 17th June 1875, No. 1,658.

THE Board observe that the existing rules on the subject of compensation for lands taken up for public purposes contained in the orders marginally noted contemplate two classes of cases, viz. :—

(1.) Cases in which compensation has to be paid for lands taken up long ago.

(2.) Cases in which it has to be paid for lands taken up for works in progress.

2. As regards the first class of cases, Government have in G.O., 8th November 1875, No. 3,187, Public Works Department, approved the suggestion of the Controller of Public Works Accounts that they should be treated exceptionally and that the compensation should be paid as soon as it is settled irrespective of budget allotments, as the liability has been incurred and is enforceable against Government in a Court of law.

3. In regard to cases falling under the second class, the course laid down is that provision for compensation should be made in the estimates for the works on account of which the lands are taken up and that the rules as regards sanction and allotment of funds apply to them.

4. The cases referred to in G.O., dated 13th November 1878, No. 919 I., have been understood by Government to fall under the second class, and as the unutilized portion of the amount provided in last year's budget had lapsed at the end of the year, it was proposed to re-allot it in the revised budget submitted to the Government of India. The Board are not aware whether provision was made and sanctioned, as the revised budget does not appear to have been communicated to them.

5. The Board do not regard Government Order, dated 13th November 1878, as affecting the course laid down in regard to cases falling under Class I. The Collector is requested to ascertain and report whether the claims referred to therein still remain unpaid. If so, the Board would recommend to Government that the cases be treated as falling under Class I and adjusted at once, as any postponement of payments legally due is likely to give rise to fresh claims and complications.

(True Copy and Extract.)

(Signed) C. A. GALTON,
Acting Secretary.

No. 41. Endorsement of the Acting Secretary to Government, Revenue Department, dated 28th November 1879.

Proceedings of the Board of Revenue, dated 29th October 1879, No. 3,052.

Read again Board's Proceedings, dated 25th September 1879, No. 8,943, Miscellaneous.

Read also G.O., dated 17th October 1879, No. 3,566, Revenue Department.

Read the following letter from J. F. PRICE, Esq., Collector of the Chingleput District, to the Acting Secretary to the Board of Revenue, dated Saidápet, 22nd October 1879, No. 749.

IN reply to the concluding paragraph of the Board's Miscellaneous Proceedings, dated 25th September last, No. 8,943, I have the honor to report that the claims referred to in G.O., Public Works Department, No. 919 I., of the 13th November 1878, still remain unadjusted.

2. In May last I received an order of Government in the Public Works Department, dated 12th May 1879, No. 291 I., which seems to have been passed

apparently under the impression that the Board's Miscellaneous Proceedings of the 22nd June 1878, No. 6,196, still remained undisposed of, whereas it had been dealt with by the Government Order quoted in paragraph 1. In this order of May last I was called upon to report what funds were then needed to adjust finally admitted claims, and in my letter No. 379 of the 10th June I replied that a sum of Rs. 45,252 was at once required for disbursement and that a further amount of Rs. 4,800 would be subsequently needed towards the payment of claims then in course of settlement but likely to be completed before the close of the current official year. The Chief Engineer for Irrigation then called for an explanation of the circumstances under which the original estimate was exceeded, and this was furnished in my letter No. 569 of the 23rd August last. The result was that Government in their Order of the 30th September 1879, No. 568 I. (copy enclosed) sanctioned the excess over the original estimate which amounted to Rs. 9,655.

3. It appears to me that the last-quoted order is merely an estimate sanction and does not constitute sufficient authority to finally adjust the claims without an allotment which has yet to be provided.

4. Under these circumstances I request that the Board will be pleased to make the recommendation suggested in their Proceedings under reply and obtain the sanction of Government to treat these cases as falling under Class I, so that no further delay may occur in their adjustment.

5. The Chembrambakam tank works were completed years ago and the claims under consideration cannot fairly be considered as falling under Class II, *i.e.*, "cases in which compensation has to be paid for lands taken up for works *in progress*."

THE Collector of Chingleput requests permission to settle claims for compensation for land taken up for Chembrambakam tank in anticipation of an allotment for the purpose. The revised estimate was sanctioned in G.O., dated 30th September 1879, No. 568 I., (Department of Public Works), but funds have not been provided. The Board consider that the case is one in which compensation may be paid irrespective of budget allotments under G.O., dated 24th November 1875, No. 2,479, and sanction is requested for this course.

(True Copy and Extract.)

(Signed) C. A. GALTON,
Acting Secretary.

To the Secretary to Government, Revenue Department, with copy of Board's Proceedings, dated 25th September 1879, Miscellaneous No. 8,943.

TRANSFERRED to the Public Works Department.

(Signed) J. H. GARSTIN,
Acting Secretary to Government.

No. 42. ORDER THEREON, 22nd December 1879, No. 739 I.

HIS GRACE the Governor in Council observes that payments on account of land compensation, in common with all Public Works charges, have to be covered by appropriations, and in cases like the Chembrambakam tank in which the

amount required is large it is especially necessary that due provision of funds be made before expenditure is incurred.

2. It appears from paragraph 2 of the Collector's letter No. 379 of the 10th June, printed in Proceedings of Madras Government No. 568 I. of the 30th September 1879, that the expected disbursements of the current year will amount to Rs. 50,052. In the budget of this year Rs. 35,006 have been provided and payments to this extent can at once be made.

3. The total amount sanctioned under compensation is Rs. 1,15,237
Amount paid to end of 1878-79 ... ... „ 53,703

Balance unpaid at beginning of 1879-80 ... ... „ 61,534

The Chief Engineer will at once arrange for the appropriation of Rs. 15,046 by transfer, from surrenders or otherwise, to meet the requirements of the current year as reported by the Collector, and Rs. 11,482 will thereafter remain to be provided either in the budget of 1880-81 or by re-appropriation.

4. It has not been explained whether there is anything to prevent the complete settlement of compensation claims on account of this project before the end of the current year provided money can be made available, and the Collector should at once report whether, if the additional amount of Rs. 11,482 be appropriated, he can arrange specially to settle all claims before the 31st March next as is eminently desirable.

5. The Examiner of Public Works Accounts will, with reference to paragraph 3 of the Collector's letter No. 379, take care that there is no delay in disposing of bills sent to him for audit, and should any of the bills referred to not have reached him, the Executive Engineer, Chingleput, should be instructed to send them on forthwith and to explain the cause of detention.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

Irrigation.

Account.

Read the following paper :—

No. 43. Endorsement of the Chief Engineer for Irrigation, dated Koradáchéri, 17th December 1879, No. 332 I.

From J. H. LATHAM, Esq., Chief Engineer and Manager of the Madras Irrigation and Canal Company, to the Chief Engineer for Irrigation, dated Kurnool, 11th December 1879, No. 174.

I HAVE the honor to enclose a copy of the Examiner's letter, No. 1,385 I., of 31st October 1879.

Mr. Simpson was appointed on Rs. 300 a-month, including horse allowance. This was done by telegram addressed to him in Calcutta, though his appointment was, by previous understanding, considered to be from Madras, and his salary was paid only for the time he was at Kurnool.

The case is not one covered by the letter of the rules, but G.O., No. 2,611, of 27th August 1867, sanctions the payment of railway fare from Madras for a horse to Engineers joining their first appointments, besides charges for carrying baggage, which Mr. Simpson did not draw. The train charge for a horse from Madras to Gooty is Rs. 24-3-0. Mr. Simpson got his horse from Bangalore at a cost of only Rs. 18-4-0. I have the honor to request the sanction of Government for the payment of Rs. 36-8-0 for the double journey of the horse.

From R. K. WILLIAMS, Esq., Officiating Examiner, Guaranteed Railway and Irrigation Accounts, to the Chief Engineer and Manager of the Madras Irrigation and Canal Company, dated Madras, 31st October 1879, No. 1,385 I.

WITH reference to the payment of Rs. 18-4-0 which has been charged in the Company's account for the conveyance of a horse for Mr. Simpson from Bangalore to Kurnool, I have the honor to notice that the Order of Government, No. 2,611, of the 27th August 1867, apparently relates only to Covenanted Engineers entitled under their agreements to certain allowances, and to suggest that application be made to Government for sanction to the payment to Mr. Simpson.

SUBMITTED for the consideration of Government.

Under the circumstances as stated by the Chief Engineer and Manager, the charge may be sanctioned, but it is considered that the duties* on which Mr. Simpson was employed made it unnecessary for him to keep a horse for their performance, and accordingly that horse allowance should not have been included in his salary.

* *Vide* paragraph 4 of letter in Proceedings, Madras Government, No. 370 I., 26th June 1879.

2. Mr. Simpson has left the Company's service.

(Signed) JOHN MULLINS, Colonel, R.E.,
Chief Engineer for Irrigation.

No. 44. ORDER THEREON, 23rd December 1879, No. 740 I.

THE charge for conveyance of Mr. Simpson's horse may be admitted.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch,

Irrigation.

Account.

Read the following paper :—

No. 44-A. *Note by the Chief Engineer for Irrigation.*

THE regular estimates for 1879-80 and the budget estimates for 1880-81 of expenditure and receipts of the Madras Irrigation and Canal Company are herewith submitted.

2. *State Outlay.*—The estimated State outlay on the establishment of control and for compensation for land to be taken up amounts to Rs. 8,000 as follows :—

—	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.
	RS.	RS.	RS.
Establishment	4,921	4,876	4,876
Compensation for land	3,079	2,500	2,500
Total ...	8,000	7,376	7,376

3. *Establishment.*—The Government contribution to the allowances of the Accountant at Kurnool has been increased by Rs. 45 on account of the annual increment to his pay.

4. *Land Compensation.*—The Collector of Cuddapah applied for Rs. 500 more than the current year's grant for the purchase of land. A sum of Rs. 79 has been added to the amount applied for by the Collector of Kurnool to make the total a round sum.

5. *Capital Outlay.*—The following establishment included by the Chief Engineer and Manager in his budget estimates in excess of the scale sanctioned in G.O., No. 311 I., dated 23rd May 1879, has been omitted, a reference made to him on 28th October last not having, as yet, been replied to :—

	RS.	RS.
1 Assistant Engineer—		
Salary	300	
Allowance	120	
		420
Increase of salary to Mr. J. O. Dunphy		100
Total ...		520

The distribution of establishment charges between Capital and Revenue has been made in accordance with the arrangement sanctioned in G.O., No. 2,072, dated 30th July 1874, the proposals for a different arrangement so far made by the Chief Engineer and Manager not having been approved.

The following statement shows the estimated outlay from Loan and Guaranteed Capital funds :—

—	Budget, 1880-81.	Regular Estimate, 1879-80.	Budget, 1879-80.
	RS.	RS.	RS.
Establishment	22,283	59,343	73,859
Main canal	750	39,397	12,000
Distribution	1,000	7,368	12,000
Navigation works	65,100	1,31,265	1,97,579
Total ...	89,133	2,37,373	2,95,438

6. *Navigation Works.*—The progress of Navigation works during the current year has not been as much as was anticipated, but they will be completed in 1880-81.

7. *Lapse of Sanctioned Estimates.*—It having been ordered by the Government of India in paragraph 2 of their letter, No. 361 I.,* dated 27th October 1879, that all previous sanctions for Capital outlay other than navigation works should lapse on the 31st March 1880, the Chief Engineer and Manager should submit estimates for the work required to be done and obtain the sanction of Government. No money will be required to be paid from the treasury during the current year, and probably none in 1880-81 for expenditure on Capital Account, as the balance in hand will about cover the expenditure contemplated.

* Printed with Proceedings, Madras Government, No. 669 I, of 6th November 1879.

8. *Balance of Refunds.*—The balance of refunds on account of abandoned portions of the Company's scheme is Rs. 1,95,562-9-8.

9. *Revenue Expenditure.*—The estimate of Revenue expenditure for 1880-81 amounts to Rs. 1,44,988, and is made up of the following items :—

——	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.
	RS.	RS.	RS.
Share of general management ...	53,074	36,381	37,383
Conservancy staff	62,389	25,976	45,440
Repairs to main canal	21,050	37,507	64,600
Do. to distributaries	6,100	8,584	12,800
Do. to buildings	1,875	1,443	2,550
Do. to telegraph	500	244	500
Total ...	1,44,988	1,10,135	1,63,273

10. *Demand and Collections.*—The Collectors of Kurnool and Cuddapah estimate the collections for 1879-80 and 1880-81 at Rs. 2,19,900 and 95,000 respectively, and the demand at Rs. 95,000 and 1,00,000 respectively.

11. *Excess of working expenses over demand.*—The estimated working expenses exceed the demand by Rs. 44,988 in 1880-81 and Rs. 15,135 in 1879-80, and the Company should provide funds to meet the excess unless they can reduce the expenditure without prejudice to the safety of the works.

12. *Special Revenue Establishment.*—The Special Revenue Establishment has been discontinued under G.O., No. 465 I., dated 19th August 1879.

13. *Forms of the Budget Estimates.*—The budget estimates are prepared in such forms as to afford the information required by the Government of India in paragraph 2 of their letter No. 35 A. I.,* dated 7th February 1879.

* Proceedings, Madras Government, No. 157 I., dated 8th March 1879.

CHEPAUK,
22nd December 1879.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

No. 44-B. ORDER THEREON, 26th December 1879, No. 742 I.

WITH the foregoing note the Chief Engineer for Irrigation submits the budget estimates of the Madras Irrigation and Canal Company for 1880-81 as well as the regular estimate for 1879-80.

The estimate of State expenditure is as follows :—

	RS.
Establishment	4,921
Compensation for land	3,079
Total ...	8,000

The charges on account of establishment for 1880-81 are Rs. 45 more than for 1879-80, the annual increment to the pay of the Accountant having raised the Government contribution.

The provision for compensation for land is Rs. 579 more than that of the current year.

2. The estimate of expenditure on Capital Account is as follows :—

	Budget, 1880-81.	Regular Estimates, 1879-80.
	RS.	RS.
Establishment	22,283	59,313
Main canal	750	39,397
Distribution	1,000	7,368
Navigation	65,100	1,31,265
Total ...	89,133	2,37,373

and is approved. The balance of Capital funds will be adequate to meet it.

3. It seems improbable that any increase of establishment will under existing circumstances be proposed by the Chief Engineer and Manager, and the omission from the budget estimates of the items referred to in paragraph 5 of the foregoing note is approved.

4. The estimated expenditure on Revenue Account exceeds the amount of the demand, as estimated by the Collectors, by Rs. 44,988 in 1880-81 and by Rs. 15,135 in 1879-80. Payments to the Company on account of working expenses will necessarily be limited by the ascertained net demand for irrigation supplied.

5. The attention of the Chief Engineer and Manager, Madras Irrigation and Canal Company, will be called to the necessity of obtaining fresh sanctions for expenditure on Capital Account for works other than navigation works, which it may be considered advisable to proceed with after 31st March next.

6. Ordered that a copy of these Proceedings be forwarded to the Government of India together with the budget estimates of the Madras Irrigation and Canal Company for 1880-81.

(True Extract.)

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

No. 44-C. (DOCKET No. 743 I., dated 26th December 1879.)

FORWARDED to the Government of India, Public Works Department.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

MADRAS IRRIGATION AND CANAL COMPANY.

Abstract of the Budget Estimates, 1880-81.

——	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actuals, 1878-79.
State Expenditure.	RS.	RS.	RS.	RS.
As per Schedule (A)	8,000	7,376	7,376	5,860
Capital Expenditure.				
Establishment as per Schedule (B)	22,283	59,343	73,859	98,999
Construction works „ (C)	1,750	46,765	24,000	20,868
Navigation do. „ (D)	65,100	1,31,265	1,97,579	2,36,975
Total, Capital Outlay ...	89,133	2,37,373	2,95,438	3,15,106
Deduct amount which may be met from the balance at the disposal of the Madras Irrigation and Canal Company	89,133	2,37,373	2,95,438	3,15,106
Net Cash Demand on the Treasury ...				
Revenue.				
Administrative—				
Earnings as per Schedule (E)	1,00,000	95,000	1,25,000	81,326
Working Expenses „ (F)	1,44,988	1,10,135	1,63,273	77,485
Net Earnings ...	— 44,988	— 15,135	— 38,273	3,841
Financial—				
Net Cash Collections, Schedule (G) ...	95,000	2,19,900	1,40,000	2,23,586
Advances for Working Expenses, Schedule (H)	1,00,000	95,000	1,25,000	1,64,316
Net Receipts in Treasury ...	— 5,000	1,24,900	15,000	59,270

SCHEDULE A.

ESTIMATE OF STATE EXPENDITURE.

Detail of Controlling Establishment.

Number 1880-81.	Number 1879-80.	Particulars.	Salary of Office.	Estimate Per Mensem.	Estimate Per Annum.	Budget Estimate 1880-81.	Regular Estimate 1879-80.	Budget Estimate 1879-80.	Actuals, 1878-79.
			RS.	RS.	RS.	RS.	RS.	RS.	RS.
		Deputation allowance to Head Clerk, office of Chief Engineer for Irrigation	50	50	600				
1	1	Head Clerk	50	50	600				
1	1	Accountant	42	42	504				
1	1	Record-keeper	50	50	600				
1	1	Draughtsman and Estimator	40	40	480				
1	1	Peon	8	8	96				
1	1	Do.	7	7	84				
1	1	Accountant	*73¾	73¾	885				
1	1	Peon	7	7	84				
						3,933	3,888	3,888	5,787
		Travelling allowance and batta for Office Establishment	...	...	...	700	700	700	
		Office expenses and contingencies	...	24	288	288	288	288	
		Total of Controlling Establishment ...	...	...	...	4,921	4,876	4,876	5,787

ESTIMATE OF STATE EXPENDITURE FOR THE PURCHASE OF LAND.

	Budget Estimate 1880-81.	Regular Estimate 1879-80.	Budget Estimate 1879-80.	Actuals, 1878-79.
Kurnool.				
Main Canal ... Distribution ... Buildings ...	1,079	1,000	1,000	...
Total ...	1,079	1,000	1,000	...
Cuddapah.				
Main Canal ... Distribution ... Buildings ...	2,000	1,500	1,500	73
Total ...	2,000	1,500	1,500	73
Total for Kurnool and Cuddapah ...	3,000	2,500	2,500	73
Grand Total of State Expenditure ...	8,000	7,376	7,376	5,860

* *Vide* G.O., No. 2,145, dated 16th August 1876.

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Detail Estimate of

Office.	Budget Estimate, 1880-81. Number.	Salary.	Allowance.	Total.
		RS.	RS.	RS.
GENERAL MANAGEMENT.				
Chief Engineer and Manager's Office.				
Chief Engineer and Manager	1	2,500	200	2,700
Chief clerk and clerks	4	...	...	200
Draughtsmen	2	...	...	70
Peons	5	...	...	35
Chainmen	4	...	...	28
Sweeper	1	...	...	2
Monthly Total ...	17	...	...	3,035
Annual Total ...	...	...	...	36,420
Chief Accountant's Office.				
Chief Accountant	1	...	...	280
Clerks	5	...	...	270
Peons	3	...	...	21
Sweeper	1	...	...	$2\frac{1}{2}$
Monthly Total ...	10	...	...	$573\frac{1}{2}$
Annual Total ...	...	...	...	6,882
Medical.				
Consulting Surgeon	1	...	...	50
Dressers	3	80	20	100
Monthly Total ...	4	...	...	150
Annual Total ...	...	...	...	1,800
Stores.				
Workshop writer	1	...	...	70
Storekeepers	4	...	...	230
Store lascars and watchmen	15	...	...	100
Monthly Total ...	20	...	...	400
Annual Total ...	...	...	...	4,800
Temporary hands	...	...	...	600
Contingencies	...	...	...	10,000
Monthly Total ...	...	...	...	...
Annual Total ...	...	...	...	10,600
Total, General Management ...	...	...	...	60,502

DULE B.

Establishments.

Regular Estimate, 1879-80.									Budget Estimate, 1879-80.	Actuals, 1878-79.
First Half-year.				Second Half-year.						
Number.	Salary.	Allowance.	Total.	Number.	Salary.	Allowance.	Total.	Total.		
	RS.	RS.	RS.		RS.	RS.	RS.	RS.	RS.	RS.
1	2,500	200	2,700	1	2,500	200	2,700	...	2,700	...
4	...	...	134	4	...	...	200	...	265	...
2	...	...	56	2	...	...	70	...	90	...
5	...	...	35	5	...	...	35	...	35	...
4	...	...	22	4	...	...	28	...	28	...
1	...	...	2	1	...	...	2	...	2	...
17	...	...	2,949	17	...	...	3,035	...	3,120	...
...	...	...	17,694	...	...	...	18,210	35,904	37,440	25,303
1	...	...	250	1	...	...	250	...	280	...
5	...	...	274	5	...	..	270	...	360	...
3	...	...	21	3	...	...	21	...	21	...
1	...	...	2½	1	...	...	2½	...	2½	...
10	...	...	547½	10	...	...	543½	...	663½	...
...	...	...	3,285	...	..	...	3,261	6,546	7,962	6,361
1	...	...	50	1	...	...	50	...	50	...
3	...	...	79	3	...	...	100	...	150	...
4	...	...	129	4	...	...	150	...	200	...
...	...	...	774	...	...	...	900	1,674	2,400	1,531
1	...	...	70	1	...	...	70	...	...	...
4	...	...	221	4	...	...	230	...	200	...
15	...	...	98	15	...	...	100	...	100	...
20	...	...	389	20	...	...	400	...	300	...
...	...	...	2,334	...	...	...	2,400	4,734	3,600	2,784
...	...	...	12	...	...	...	300	...	600	...
...	...	...	322	...	...	...	5,000	...	1,000	...
...	...	...	334	...	...	...	...	...	...	...
...	...	...	2,004	..	...	...	5,300	7,304	10,600	12,606
...	...	...	26,091	...	...	...	30,071	56,162	62,002	48,585

Detail Estimate of

Office.	Budget Estimate, 1880-81. Number.	Salary.	Allowance.	Total.
GENERAL MANAGEMENT—*cont.*		RS.	RS.	RS.
Personal Staff.				
Engineers	2	1,250	300	1,550
Chainmen	8	...	...	56
Assistant Engineers	1	350	120	470
Do.	...	...	...	...
Chainmen	8	...	...	56
Monthly Total ...	19	...	...	2,132
Annual Total ...	...	...	...	25,584
CONSERVANCY STAFF.				
Upper Division.				
Surveyors	1	150	40	190
Sub-Assistant Engineer	...	...	...	...
Chainmen	3	...	...	21
Overseers and Amins	20	400	100	500
Tindals	5	...	...	60
Bankers	179	...	...	1,074
Sluice-keepers	15	...	...	90
Accountants and Clerks	8	...	...	190
Draughtsman	1	...	...	35
Telegraph Signallers	2	...	...	40
Cash Peons	3	...	...	21
Contingencies	...	...	...	50
Masonry Inspector	...	...	...	...
Monthly Total ...	237	...	...	2,271
Annual Total ...	...	...	...	27,252
Lower Division.				
Sub-Assistant Engineer	...	...	...	...
Masonry Inspector	...	...	...	...
Surveyors	2	150	60	210
Do. Chainmen	6	...	...	42
Overseers and Amins	16	400	100	500
Tindals	3	...	...	30
Bankers	150	...	...	900
Sluice-keepers	9	...	...	54
Accountants and Clerks	6	...	...	190
Draughtsmen	1	...	...	35
Cash Peons	3	...	...	21
Sweeper	1	...	...	2
Contingencies	...	...	...	50
Monthly Total ...	197	...	...	2,034
Annual Total ...	...	...	...	24,408
Total Conservancy and Personal Staff ...	...	..	...	77,244
Grand Total of Establishment ...	...	...	...	1,37,746

* J. M. Simpson, Esq., with retrospective effect during

Establishments—*cont.*

Regular Estimate, 1879-80.									Budget Estimate, 1879-80.	Actuals, 1878-79.
First Half-year.				Second Half-year.						
Number.	Salary.	Allowance.	Total.	Number.	Salary.	Allowance.	Total.	Total.		
	RS.	RS.	RS.		RS.	RS.	RS.	RS.	RS.	RS.
1	450	150	600	1	450	150	600	...	1,550	...
...	...	...	50	...	...	...	56	...	56	...
1	300	120	420	1	300	120	420	...	940	...
*1	...	...	223	*1	300	...	300	...	...	...
	...	...	50	...	...	...	56	...	56	...
...	...	...	1,343	...	...	...	1,432	...	2,602	...
...	...	...	8,058	...	...	...	8,592	16,650	31,224	29,053
1	...	...	115	1	...	...	65	...	160	...
...	...	...	...	...	...	...	...	...	260	...
...	...	...	..	3	...	...	21	...	49	...
10	...	...	454	10	...	...	500	...	700	...
5	..	...	51	5	...	...	60	...	60	...
179	...	...	1,028	179	...	...	1,074	...	1,074	...
15	...	...	88	15	...	...	90	...	90	...
6	...	...	167	6	...	...	190	...	200	...
1	...	...	30	1	...	...	35	...	35	...
2	...	...	21	2	...	...	40	...	50	...
3	...	...	18	3	...	...	21	...	28	...
...	...	...	128	...	...	...	50	...	25	...
1	...	...	122	1	...	...	210	...	165	...
223	...	...	2,222	226	...	...	2,356	...	2,896	...
...	..	...	13,332	...	...	...	14,136	27,468	34,752	25,926
1	...	...	123	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	150	...
2	...	...	31	2	150	60	210	...	210	...
6	...	...	9	6	...	...	42	...	42	...
16	...	...	345	16	400	100	500	...	700	...
3	...	...	10	3	...	...	40	...	40	..
153	...	...	695	153	...	...	906	...	906	...
9	...	...	43	9	...	...	54	...	54	...
6	...	...	188	6	...	...	200	...	200	...
1	...	...	9	1	...	...	35	...	35	...
3	..	...	26	3	...	...	21	...	28	...
1	...	...	2	1	...	...	2	...	2	...
...	...	...	29	...	...	...	50	...	25	...
201	...	...	1,510	200	...	...	2,060	...	2,392	...
...	...	...	9,060	...	...	...	12,360	21,420	28,704	19,542
...	...	...	...	...	...	...	...	65,538	94,680	74,521
...	...	...	...	...	...	...	...	1,21,700	1,56,682	1,23,106

r. Wilks' absence. G.O., No. 370 I, of 26th June 1879.

Detail Estimate of

Office.	Budget Estimate, 1880-81. Number.	Salary.	Allowance.	Total.
ABSTRACT.		RS.	RS.	RS.
Capital.				
General Management	...	...	...	7,428
Conservancy and Personal Staff	...	...	...	14,855
Total ...	...	...	...	22,283
Revenue.				
General Management	...	...	...	53,074
Conservancy and Personal Staff	...	...	...	62,389
Total ...	...	...	...	1,15,463

Establishments—*cont.*

Regular Estimate, 1879-80.									Budget Estimate, 1879-80.	Actuals, 1878-79.
First Half-year.				Second Half-year.						
Number.	Salary.	Allowance.	Total.	Number.	Salary.	Allowance.	Total.	Total.		
	RS.	RS.	RS.		RS.	RS.	RS.	RS.	RS.	RS.
...	...	...	...	...	...	...	...	19,781	24,619	33,375
..	...	...	...	...	...	...	...	39,562	49,240	65,624
...	...	...	...	...	...	...	...	59,343	73,859	98,999
...	...	...	...	...	...	...	...	36,381	37,383	15,210
...	...	...	...	...	...	...	...	25,976	45,440	8,897
...	...	...	...	...	...	...	...	62,357	82,823	24,107

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Detail of Estimate of Expenditure

Name of Work.	Amount of sanctioned Estimate.	Actual Expenditure up to 31st March 1879.	Budget Estimate, 1880-81.
1	2	3	4
	RS.	RS.	RS.
Main Supply.			
Anicuts and Head Works	14,02,362	9,74,869	...
Hindry Aqueduct	* 3,34,764	2,78,110	...
Canal near Kurnool Anicut	65,000	49,422	...
Main Canal, 6th Section, enlargement of Main Canal.	9,46,394	9,12,127	750
Completed works	89,47,643	84,86,955	...
Total ...	1,16,96,163	1,07,01,483	750
Distribution.			
Distribution works, 6th Section, enlarging Toodicherla Channel	72,838	58,023	1,000
Completed works	2,70,439	1,85,087	...
Total ...	3,43,277	2,43,110	1,000
Breach repairs of August 1870, completed works ...	62,440	54,084	...
Buildings.			
Office, Store, and Workshops at Kurnool	19,646	17,297	...
Sluice-keepers' huts	3,200	2,917	...
Overseers' houses	1,100	754	...
Dwellings and out-buildings for an Apothecary and two Clerks at Dhoor...	2,000	...	...
Completed works	65,718	62,439	...
Total ...	91,664	83,407	...
Line of Telegraph.			
Completed works	72,034	71,496	...
Grand Total ...	1,22,65,578	1,11,53,580	1,750

DULE C.

on Construction Works.

Regular Estimate 1879-80.			Budget Estimate, 1879-80.	Actuals, 1878-79.	—
From 1st April to 31st August 1879.	From 1st September 1879 to 31st March 1880.	Total.			
5	6	7	8	9	
RS.	RS.	RS.	RS.	RS.	
...	...	...	...	**67,188**	The figures in Clarendon type represent recoveries of outlay.
...	25,500	25,500	...	...	* Including the amount (Rs. 54,107) sanctioned in G.O., No. 411 I., of 23rd July 1879.
...	...	...	...	...	
6,569	7,000	13,569	...	38,964	
328	...	328	...	**389**	
6,897	32,500	39,397	12,000	**28,613**	
3,368	4,000	7,368	...	7,745	
...	...	...	...	...	
3,368	4,000	7,368	12,000	7,745	
...	...	...	...	...	
...	...	...	...	...	
...	...	...	...	...	
...	...	...	...	...	
...	...	...	...	...	
...	...	...	...	...	
...	...	...	...	...	
...	...	...	...	...	
...	...	46,765	24,000	**20,868**	

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Detail Estimate of Expenditure

Name of Work.	Amount of sanctioned Estimate.	Actual Expenditure up to 31st March 1879.
1	2	3
	RS.	RS.
I.—Telegraph	75,600	63,836
II.—Weirs, Bridges, &c.	24,103	15,280
III.—Wharves and Bollards	26,222	5,100
IV.—Buildings	81,117	24,404
V.—Completion of Locks	19,184	4,193
VI.—Completing Canal	51,990	15,113
VII.—Floating Plant	1,52,870	86,459
VIII.—Workshop Buildings at Kurnool	10,966	3,958
Contingencies	...	18,692
Total ...	*4,42,052	2,37,035

DULE D.

on Navigation Works.

Budget Estimate, 1880-81.	Regular Estimate, 1879-80. From 1st April to 31st August 1879.	Regular Estimate, 1879-80. From 1st September 1879 to 31st March 1880.	Regular Estimate, 1879-80. Total.	Budget Estimate, 1879-80.	Actuals, 1878-79.	—
4	5	6	7	8	9	
RS.	RS.	RS.	RS.	RS.	RS.	
5,000	718	6,000	6,718	...	63,836	
1,490	4,333	3,000	7,333	...	15,220	
14,549	1,573	5,000	6,573	...	*5,100	* Sanctioned in G.O., No. 669 I. of 6th November 1879.
19,047	21,666	16,000	37,666	...	24,404	
8,442	1,549	5,000	6,549	...	4,193	
5,493	11,384	20,000	31,384	...	15,113	
21,966	5,881	30,000	35,881	...	86,459	
600	2,366	4,000	6,366	...	3,958	
— 11,487	— 7,205	...	— 7,205	...	18,692	
65,100	42,265	89,000	1,31,265	1,97,579	2,36,975	

SCHEDULE E.

Estimate of Revenue Earnings.

District.	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actuals, 1878-79.
	RS.	RS.	RS.	RS.
Kurnool	50,000	45,000	75,000	42,056
Cuddapah	50,000	50,000	50,000	39,270
Total ...	1,00,000	95,000	1,25,000	81,326

REVENUE.

SCHEDULE F.

Estimate of Working Expenses.

—	—	Budget Estimate, 1880-81.	Regular Estimate, 1879-80. From 1st April to 31st August 1879.	Regular Estimate, 1879-80. From 1st September 1879 to 31st March 1880.	Regular Estimate, 1879-80. Total.	Budget Estimate, 1879-80.	Actuals, 1878-79.
		RS.	RS.	RS.	RS.	RS.	RS.
General Management.	...	53,074	34,181	2,200	*36,381	37,383	15,210
Conservancy and Personal Staff.	...	62,389	5,889	20,087	*25,976	45,440	8,897
Main Canal repairs.	Upper division.	16,650	10,730	42,701	31,971	45,500	36,243
	Lower do.	4,400	666	4,870	5,536	19,100	12,438
Distribution repairs.	Upper do.	2,500	404	2,865	3,269	4,000	656
	Lower do.	3,600	782	4,533	5,315	8,800	2,916
Building repairs.	Upper do.	750	99	613	712	750	896
	Lower do.	1,125	85	646	731	1,800	163
Telegraph do. ...	Upper do.	250	4	240	244	250	66
	Lower do.	250	...	...	...	250	...
Total ...	...	1,44,988	31,380	78,755	1,10,135	1,63,273	77,485

—	General Management.	Conservancy Establishment.
	RS.	RS.
* Total cost as per Schedule B ...	56,162	65,538
Deduct—		
Chargeable to Capital at 33 per cent. on outlay on works.	19,781	39,562
Balance chargeable to Revenue ...	36,381	25,976

REVENUE.

SCHEDULE G.

Estimate of Net Cash Collections of the Madras Irrigation and Canal Company.

District.	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actuals, 1878-79.	—
	RS.	RS.	RS.	RS.	
Kurnool	50,000	1,37,187	95,000	1,67,441	
Cuddapah	45,000	82,713	45,000	56,145	
Total ...	95,000	2,19,900	1,40,000	2,23,586	

REVENUE.

SCHEDULE H.

Estimate of Advances for Working Expenses of the Madras Irrigation and Canal Company.

District.	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actuals, 1878-79.	—
	RS.	RS.	RS.	RS.	
Kurnool	50,000	45,000	} 1,25,000	1,64,316	
Cuddapah	50,000	50,000			
Total ...	1,00,000	95,000	1,25,000	1,64,316	

Irrigation.

Account.

Read the following paper :—

No. 45. No. 331 I.

Note by the Chief Engineer for Irrigation.

THE accompanying statement of surrenders and demands has been prepared from the applications for modification of allotments received from the Superintending Engineers. The principal works for which demands have been made are as follows :—

2.—*South Arcot Division.*

Pelandorai Anicut System.

(1) Capital.

Rupees 140 for the extension of the rough stone apron—Estimate Rs. 2,820 sanctioned in G.O., No. 642 I., dated 16th August 1878.

(2) Revenue, Maintenance and Repairs.

Rupees 1,697, closing breach in anicut—Estimate Rs. 34,155 sanctioned in G.O., No. 642 I., dated 16th August 1878. Rs. 2,500 providing temporary escapes, main channel, as directed in G.O., No. 457-A I., dated 13th August 1879.

Item (2) can be met by Rs. 4,000 from the sum held at the disposal of Government under this head, *vide* G.O., No. 422 I of 29th July 1879. Rs. 197 by transfer from Chingleput Division under same head.

3.—*North Arcot Division.*

Palar Anicut System.

Revenue, Maintenance and Repairs.

Rupees 3,350 are asked for to repair tanks, and the amount can be provided by transfer from the Chingleput Division in which the expenditure to 30th September was Rs. 791 only against a grant of Rs. 10,000.

4.—*Chingleput Division.*

Agricultural—River Embankments.

Original Works.

Rupees 1,092—Corteliar R. flood bank above Thamarapak anicut.
„ 2,465— Do. L. do. do.

3,557

It is explained that the work was done prior to the restrictive orders. Application was made for funds in May 1879 which was refused in G.O., No. 401 I, of 16th July 1879, under the impression that work had not been commenced. It is not shown what money is needed to complete the embankments, but if the Divisional Engineer can arrange for their completion it will be desirable to complete them. The amount asked for can be provided from the surrenders under M.O.W., River Embankments to the extent of Rs. 1,800 and the rest from M.O.W., River Conservancy.

The following abstract of surrenders and demands includes only those which belong to the same fund heads :—

——	Surrenders.	Demands.	Net Amount Available.
Irrigation and Navigation Works for which Capital and Revenue Accounts are not kept.	RS.	RS.	RS.
Minor Original Works	9,200	1,200	8,000
Repairs	78,180	23,158	55,022
Agricultural.			
Major Original Works	...	3,557	} 1,988
Minor do. do.	5,645	100	
Repairs	23,508	12,520	10,998
Total ...	1,16,533	40,535	75,998

The large amount surrendered this year is due chiefly to the recent reductions of establishment and to the numerous transfers of officers and subordinates therefrom resulting. These changes cannot fail to have a very prejudicial effect on the efficiency of irrigation works generally. It is anticipated that further surrenders will have to be made judging from the latest progress reports received in this office.

5. The following transfers will be required under Revenue Maintenance and Repairs :—

From		*To*	
Chingleput Division—	RS.	South Arcot Division—	RS.
Palar Anicut System	3,547	Pelandorai Anicut System ...	197
		North Arcot Division—	
		Palar Anicut System	3,350
		South Arcot Division—	
Reserve at disposal of Government.	4,000	Pelandorai Anicut System ...	4,000

6. The demands previously sanctioned and registered against any reserve at the disposal of Government which might become available amount to Rs. 36,778 and to these has been added a sum of Rs. 30,000 to provide for cross drainage and other works required to improve the navigation of the Commamur Canal, with reference to the requirements shown in Proceedings of Madras Government, No. 621 I, of the 17th October 1879, and to the reports of damage recently submitted to Government and a provision under Tools and Plant. The following transfer of funds may be sanctioned to meet these demands subject to the confirmation of the Government of India :—

From		*To*	
Irrigation and Navigation Works for which Capital and Revenue Accounts are not kept.	RS.	*Ordinary Public Works.*	RS.
Minor Original Works	8,000	Godávari Delta System—	
Repairs	55,022	Dowlaishweram under sluice improvements	5,000
Agricultural.		KISTNA DELTA SYSTEM.	
Minor Original Works	1,988	WESTERN DELTA SECTION.	
Repairs	10,998	*Commamur Canal.*	
		Pedda Ganjam lock	16,592
		Other works	30,000
		Tools and Plant	9,220
		IRRIGATION AND NAVIGATION WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.	
		Capital.	
		Chembrambaukum tank—	
		Compensation for land	15,046
		Pelandorai Anicut System—	
		Extending rough stone apron ...	140
Total ...	75,998	Total ...	75,998

The provision for Tools and Plant, Commamur Canal, has been inserted to allow of the adjustment of the payment debited to the Godávari Delta System on account of the "Charles Orr" steam launch received in February 1879 from the Dockyard at Calcutta, which adjustment should now be carried out, and to allow of the fitting up of this steamer on the estimate sanctioned in G.O., No. 572 I., dated 30th September 1879.

7. The Superintending Engineer, First Circle, should report as soon as possible what distribution of the additional 30,000 rupees allotted to the Commamur Canal for Navigation Works he proposes to make, and whether any further grant will be required.

8. The Superintending Engineer, Fifth Circle, has surrendered Rs. 8,560 from the grant for the Srívaikuntham Anicut System under the head Capital Productive Public Works, the revised estimate for the project not having as yet been submitted. This work is under execution from Loan Funds.

9. It is to be observed that complete statements have not as yet been received from First, Second or Third Circles, although urgent reminders have been sent. Any further surrenders and demands will therefore be dealt with separately.

(Signed) C. VINCENT,
for Chief Engineer for Irrigation.

16th December 1879.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 46. ORDER THEREON, 26th December 1879, No. 744 I.

THE transfers of funds recommended in the foregoing Note are sanctioned, those referred to in paragraph 6 subject to the confirmation of the Government of India.

2. The Superintending Engineer, First Circle, will furnish the information required as noted in paragraph 8 of the foregoing Note.

3. The amount surrendered from the grant for the Srívaikuntham Anicut Project will be reported to the Government of India.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

STATEMENT showing the modifications of Irrigation Allotments for 1879-80.

Surrenders.	Amount.	Total.	Demands.	Amount.	Total.
	RS.	RS.	Irrigation and Navigation Works for which Capital and Revenue Accounts are kept—	RS.	RS.
			Capital.		
			Pelandorai Anicut System—Extending rough stone apron	140	140
			Revenue.		
			Maintenance and Repairs.		
			Pelandorai Anicut System.	4,197	
			Palar Anicut System ...	3,350	7,547
Irrigation and Navigation Works for which Capital and Revenue Accounts are not kept—			Irrigation and Navigation Works for which Capital and Revenue Accounts are not kept—		
Minor Original Works.			*Minor Original Works.*		
Ganjam	2,000		South Arcot	1,000	
Guntúr	3,000		Coimbatore	200	
North Arcot	2,000				
Salem	1,200				
Trichinopoly	1,000	9,200			1,200
Repairs.			*Repairs.*		
Nellore	15,000		Vizagapatam	1,688	
Cuddapah	8,000		Bellary	10,000	
Anantapur	2,000		Coimbatore	6,470	
North Arcot	10,852		Madura	5,000	
South Arcot	31,000				
Salem	836				
Malabar	492				
Trichinopoly	10,000	78,180			23,158
Agricultural.			*Agricultural.*		
			River Embankments.		
			Cortelliar right flood bank.	1,092	
			Do. left do. ...	2,465	3,557
Minor Original Works.			*Minor Original Works.*		
River Conservancy.					
South Arcot	400				
Coimbatore	745				
Tinnevelly	1,000				
Total ...	2,145				

STATEMENT showing the modifications of Irrigation Allotments for 1879-80—*contd.*

Surrenders.	Amount.	Total.	Demands.	Amount.	Total.
River Embankments.	RS.	RS.		RS.	RS.
Ganjam	800				
Guntúr	500				
Coimbatore	500				
Total ...	1,800				
Drainages.					
Guntúr	500				
North Arcot	200				
South Arcot	300				
Tinnevelly	500				
Total ...	1,500				
Miscellaneous.			*Miscellaneous.*		
North Arcot	100		Coimbatore	100	
South Arcot	100				
Total ...	200	5,645	Total ...	100	100
Repairs.			*Repairs.*		
River Conservancy.			*River Conservancy.*		
Guntúr	500		South Arcot	1,800	
Trichinopoly	1,000		Coimbatore	3,797	
Negapatam	3,000		Salem	836	
Tinnevelly	1,490				
Sátúr	500				
Total ...	6,490		Total ...	6,433	
River Embankments.			*River Embankments.*		
Guntúr	1,100		South Arcot	6,000	
Coimbatore	643				
Trichinopoly	4,000				
Tanjore	5,000				
Sátúr	3,600				
Total ...	14,343		Total ...	6,000	
Drainages.					
Guntúr	800				
North Arcot	500				
South Arcot	400				
Tinnevelly	675				
Total ...	2,375				
Miscellaneous.			*Miscellaneous.*		
Guntúr	100		Coimbatore	87	
South Arcot	200				
Total ...	300	23,508	Total ...	87	12,520
Grand Total ...	...	1,16,533	Grand Total ...	...	48,222

(Signed) JOHN MULLINS, Colonel, R.E.,
Chief Engineer for Irrigation.

16th December 1879.

Irrigation.
Account.

Read the following paper :—

No. X.

No. 47. *Note by the Chief Engineer for Irrigation.*

IRRIGATION BUDGET ESTIMATE FOR 1880-81.

THE Budget Estimates are submitted to Government with the following observations.

2. The provisional grants fixed by the Government of India in their Resolution No. 159-65 A.—I., dated 18th November 1879, are—

	RS.
For Capital Productive Public Works	1,55,000
,, Ordinary Productive do.	6,57,000
,, Irrigation and Navigation Works	15,50,000
,, Agricultural Works	2,00,000
	25,62,000

3. The proposed expenditure on Capital Productive Public Works amounts to only Rs. 1,10,000. Including Rs. 1,50,000, being the amount of refund from Imperial Ordinary and Provincial grants on account of the Chembrambakam Tank Project and the Madras Water-supply and Irrigation Extension Project, the gross amount available for expenditure will be Rs. 2,60,000, which has to be distributed as follows :—

	RS.
Works	1,66,535
General Establishment at 25 per cent.	41,634
Portion of Chief Engineer's Establishment	4,668
General Tools and Plant at 2½ per cent.	4,163
Special Plant	43,000
	2,60,000

The Budget Estimates provide under "Works" for—

Godávari Delta System	1,26,535
Kistna do.	10,000
Srivaikuntham Anicut System	30,000
	1,66,535

4. The proposed expenditure, as compared with the estimates for works, is as follows :—

—	Amount of Estimate.	Expenditure.	
		Estimated to end of 1879-80.	Proposed for 1880-81.
Godávari Delta System.			
Eastern Delta Project	12,89,505	10,13,509	34,785
Western do.	13,18,213	10,93,304	91,750
Kistna Delta System.			
Ryves' Canal Project	4,08,093	3,58,950	10,000
Srivaikuntham Anicut System.			
Srivaikuntham Anicut Project	9,64,270	9,41,873	30,000

5. *Godávari Delta System.*—Nearly all the principal works in the Eastern Delta Project, except the Takee Drain, have been completed, but many minor works, especially under Distributaries, remain to be carried out. In this as in the Western Delta the designing in detail of minor works of distribution has been delayed owing to the delta having been for a long time under-officered. The completion estimates for the Central Delta are nearly ready, and very little progress will be possible with their preparation until the full complement of officers has been made up. No provision has been made in the budget for works appertaining to these estimates.

6. *Kistna Delta System, Ryves' Canal.*—Since the project for this canal was drawn up a change in the arrangements therein sanctioned for the improvement of the Gudivada Channel has been found necessary in order to avoid obstruction to drainage, and for this altered work provision has been made in the completion estimates. Most of the other work has been completed, and the allotment of Rs. 10,000 entered in the budget is expected to suffice to carry out all the work remaining to be done.

7. The revenue information that is required before sanction can be accorded to the Delta Completion Estimates not having as yet been furnished by the Revenue Department no provision has been made for works included in these estimates.

8. *Srivaikuntham Anicut System.*—The revised estimates for the Srivaikuntham Anicut Project are shortly expected from the Superintending Engineer, Fifth Circle. The proposed allotment exceeds the sanctioned estimates for works by Rs. 7,603. Expenditure will, pending the sanction of the revised estimates, be confined to works which have already been sanctioned.

9. The entries under Special Plant are for—

Godávari Delta System.

	RS.
(1) A steamer	20,000
(2) Portable engine and pumps for baling water	13,000
(3) Additions and improvements to the floating plant	10,000
	43,000

(1) Provision for one steamer has been made for several years and although advice of its having been ordered by the Secretary of State was received in February last, it is doubtful whether it will be completed and forwarded in time to allow of its being paid for out of the allotment provided in the Budget of 1879-80. Rs. 20,000 have therefore been entered on this account in the Budget of 1880-81.

(2) Inadequate means of unwatering the foundations of tidal locks having occasioned delay and considerably increased expense, it is intended to obtain some additional pumps for this purpose.

(3) The additions and improvements to floating plant call for no remark.

10. The grant for Ordinary Productive Public Works has to be distributed as follows :—

	RS.
Extensions and Improvements	23,000
Maintenance and Repairs	3,45,000
General Establishment at 25 per cent.	92,000
Share of Chief Engineer's Establishment	11,830
Survey Establishment	1,000
Water Regulation and Navigation Establishments	92,153
Special Revenue Investigation Establishment	13,000
General Tools and Plant at 2½ per cent.	9,200
Special Plant	69,817
	6,57,000

11. The proposed grants for extensions and improvements and for maintenance and repairs are compared below with those of the current year :—

—	Extensions and Improvements.		Maintenance and Repairs.	
	1880-81.	1879-80.	1880-81.	1879-80.
	RS.	RS.	RS.	RS.
Godávari Delta System	6,000	6,000	1,40,500	1,66,480
Kistna do.	4,000	4,000	1,15,000	1,15,212
Pennér Anicut System	1,000	2,000	17,500	27,000
Cauvery Delta System	10,000	8,500	50,000	66,500
Srivaikuntham Anicut System	2,000	2,000	22,000	22,500
Total ...	23,000	22,500	3,45,000	3,97,692

12. The reconstruction of the Godávari Central Delta head sluice occasioned an abnormal outlay in 1879-80. This work will be completed by the end of the year, and a smaller sum will suffice for 1880-81.

13. The grants for the Pennér Anicut System have been reduced partly because the total grant is inadequate, and partly because the allotment under Maintenance and Repairs for 1879-80 seemed greater than was necessary.

14. The requirements under Special Plant amount to Rs. 69,817 as follo ws :—

—	Godávari.	Kistna.
	RS.	RS.
New Supplies	2,000	1,500
Annual Maintenance	16,397	8,970
Special Repairs	20,500	12,000
License Fees	5,950	2,500
Total ...	44,847	24,970

It having been ruled in G.O., No. 877 I., dated 4th November 1878, that all Government vessels requiring to navigate the canals are to be brought under the operation of the navigation rules and bye-laws so far as applicable, instead of being as heretofore exempted from payment of fees and tolls, the amount required for the purpose has been provided for. This, though a nominal expenditure, corresponding amounts being included in the estimate of receipts, has the effect of reducing the amount available for outlay by Rs. 8,450.

15. Rs. 1,000 have been provided for temporary Survey Establishments which may be required from time to time.

16. The following Water Regulation and Navigation Establishments have been provided for in anticipation of sanction which has been applied for—

	RS.	
1 Superintendent	8	Required for the weir at end of Injeram Canal, Godávari Eastern Section.
1 Lascar	6	
2 Lascars	12	Do. for Chintalapudy and Indupally weirs in Godávari Central Section.
1 Lock Superintendent	12	Do. for Pedda Ganjam Lock on Commamur Canal, Kistna Western Section.
4 Lascars	26	

17. The special Revenue Investigation Establishment, for which Rs. 13,000 have been entered, was sanctioned in G.O., No. 443-A I., dated 7th August 1879.

18. The Board of Revenue not having as yet furnished the Regular and the Budget Estimate of Irrigation Revenue for 1879-80 and 1880-81, respectively, the figures for these have been taken from the forecast of Irrigation Revenue shown in their Proceedings No. 2,677,* dated 22nd September 1879.

* Printed with Proceedings of Madras Government, Revenue Department, No. 2,040, dated 11th October 1879.

19. The receipts compare with the charges as follows :—

	1880-81.	1879-80.
	RS.	RS.
Revenue realized in Civil Department	53,86,000	53,38,000
Public Works Department ...	1,30,200	1,13,102
Total ...	55,16,200	54,51,102
Charges—Working expenses	6,57,000	7,04,089
Share of collection charges in Civil Department at 7·2 per cent.	3,87,792	3,84,336
Total charges ...	10,44,792	10,88,425
Net receipts	44,71,408	43,62,677
Interest charges	7,85,632	7,68,929

20. The Government of India have omitted to make a provisional allotment for Ordinary Public Works though the navigation works on the Commamur Canal in the Kistna Delta were ordered to be carried out from this fund in Government of India letter† No. 48 I, dated 2nd April 1879 ; the improvements to the Vijeshwaram under sluices of the Godávari Anicut and the Kodamurti-Trimulrajen regulators in Tanjore also need allotments and are too important to be postponed. A sum of Rs. 1,19,500 has therefore been distributed for Ordinary Public Works as detailed below, a corresponding reduction having been made from the provisional allotment for Irrigation and Navigation works, leaving Rs. 14,30,500 for the latter :—

† Printed with Proceedings of Madras Government, No. 257 I., dated 23rd April 1879.

	RS.
Works	88,925
General Establishment at 25 per cent.	22,231
Share of Chief Engineer's Establishment	3,121
Survey Establishment	3,000
General Tools and Plant at 2½ per cent	2,223
	1,19,500

21. The estimates provide under works for :—

	RS.
Godávari Delta System	4,000
Kistna do.	71,675
Cauvery do.	13,250
	88,925

22. The proposed expenditure compares with the estimates for works as follows :—

Works.	Amount of Estimate.	Expenditure.	
		Estimates to end of 1879-80.	Proposed for 1880-81.
	RS.	RS.	RS.
Godávari Delta System.			
Vijeshvaram Under Sluices, improving	8,700	4,700	4,000
Kistna Delta System.			
Compensation for lands taken up for old channels in former years	...	...	3,000
Lock and Tappal Lascar's sheds	5,795	2,350	3,445
Navigation Works on Commamur Canal	2,73,500	92,455	65,230
Cauvery Delta System.			
Kodamurti and Tirumalrajen Regulators	31,380	29,710	1,670
Upper Coleroon Anicut under sluices, improving	11,580	...	11,580

23. A sum of Rs. 3,000 has been provided for temporary Survey Establishments, which will probably be required in connection with the revised estimates of the Survapully Project in Nellore and the works in progress in the Godávari, Kistna and Tanjore Districts.

24. The amount left for Irrigation and Navigation Works, viz., 14,30,500, has been distributed as follows :—

—	Works for which Capital and Revenue Accounts are kept.		Works for which Capital and Revenue Accounts are not kept.
	Capital.	Revenue.	
	RS.	RS.	RS.
Works...	39,390	6,000	2,21,800
Repairs	...	25,000	7,32,500
General Establishment at 25 per cent	9,847	7,750	2,38,575
Share of Chief Engineer's Establishment	1,278	1,231	31,437
Survey Establishment	...	1,000	10,000
Water Regulation and Navigation Establishments ...	...	4,044	16,830
General Tools and Plant at $2\frac{1}{2}$ per cent.	985	775	23,858
Special Plant	...	200	...
Refund to Capital Productive Public Works on account of Chembrambakam Tank	50,000	...	...
State outlay on Guaranteed Irrigation Works	8,000	...	...
Total ...	1,09,500	46,000	12,75,000

25. The following works have been provided for under Capital:—

	RS.
1. Palar Anicut System, northern section	16,000
2. Pelandorai Anicut System	23,390

The estimate, amounting to Rs. 2,82,000, for the Palar Anicut System was reviewed in the Irrigation Department and sanctioned in the Revenue Department as a Famine Relief Work. The work was stopped on the cessation of Famine Relief Works, and it is desirable, in order to obtain the full benefit of the work already done, to complete some of the works which were left unfinished. The estimate will be submitted for the sanction of the Government as soon as the normal value of work done has been determined. The heavy rain of the 11th and 12th July 1879 caused serious damage to the Pelandorai Anicut Main Channel, the left bank of which was breached in 39 places, for the most part where jungle streams fall into the main channel. The execution of the cross drainage works sanctioned in G.O., Nos. 267 I. and 407 I., of 30th July 1877 and 15th May 1878, respectively, has been long delayed for want of funds and cannot with prudence be further postponed.

26. The allotments proposed for extensions and improvements and maintenance and repairs compare with those of the current year as follows:—

—	Extensions and Improvements.		Maintenance and Repairs.	
	1880-81.	1879-80.	1880-81.	1879-80.
	RS.	RS.	RS.	RS.
Chembrambakam Tank	500	500	5,000	8,000
Palar Anicut System	4,500	6,000	15,000	27,024
Pelandorai Anicut System	1,000	1,000	5,000	8,326
Total ...	6,000	7,500	25,000	43,350

27. Rs. 1,000 for temporary Survey Establishment and Rs. 200 for a boat required for the Palar Anicut System have been provided for.

28. The allotments proposed for works for which Capital and Revenue Accounts are not kept compare with those of the current year as follows:—

—	ORIGINAL WORKS.		Repairs.
	Major.	Minor.	
	RS.	RS.	RS.
Allotment, 1880-81	80,000	1,41,800	7,32,500
Do. 1879-80	36,787	1,55,000	8,25,710

Reduced amounts for minor works and repairs have been rendered necessary in order to provide for the following major works :—

		RS.
Godávari	1.—Byana Weir improvements	5,160
Kurnool	2.—Pedda Cumbum Channel	16,480
	3.—Do. Cutwa Channel new head	1,763
Chingleput	4.—Madras Water-supply and Irrigation Extension Project	32,847
Salem	5.—Pennagundapuram Tank	10,000
Coimbatore	6.—Chitrachavady Channel head sluice	1,500
	7.—Coorchy Channel head sluice	3,530
Tanjore	8.—Lower Coleroon Anicut under sluices, improving ...	8,720
		80,000

The first work is far advanced towards completion, the second, third, and the sixth were commenced from famine funds; the last two have not been commenced though estimates for them were duly sanctioned. The estimates for the fifth, which was likewise nearly completed as a famine relief work, and the revised estimates for the fourth work, have been received and will be submitted shortly for sanction.

29. The estimate of revenue of the Irrigation and Navigation Works not having been furnished by the Board of Revenue, and there being no information available from any other source, the item of revenue and share of collection charges in the Civil Department have not been shown in the Budget Estimates.

30. The provisional allotment of Rs. 2,00,000 for Agricultural Works has been distributed as follows :—

	RS.
Original Works	53,800
Repairs	97,200
General Establishment at 25 per cent.	37,750
Share of Chief Engineer's Establishment	4,907
River Conservancy Establishment	2,568
General Tools and Plant at $2\frac{1}{2}$ per cent.	3,775
	2,00,000

31. The proposed allotments for works and repairs compare as follows with those of the current year :—

—	Original Works.		Repairs.
	Major.	Minor.	
	RS.	RS.	RS.
Allotments for 1880-81	33,800	20,000	97,200
Do. 1879-80	13,890	37,100	1,98,000

The amount assigned by the Government of India being less than that applied for by Rs. 1,14,000, more than Rs. 33,800 could not be provided for major works, although the allotments for minor works and repairs have been reduced considerably below the normal requirements.

The amounts it was proposed to allot under the above heads before the receipt of the orders of the Government of India regarding the budget assignments and the amounts as reduced under those orders are shown in the accompanying statements marked 1 and 2.

32. The distribution of grants by divisions for Minor Original Works and Repairs is shown in schedules marked B and C.

22nd December 1879.

(Signed) JOHN MULLINS, Col., R.E.,
Chief Engineer for Irrigation.

No. 1.

Statement showing the amounts allotted for Major Works prior to receipt of Budget Orders but reduced or struck out under those Orders.

Divisions.	Names of Works.	Amount of Estimate.	Proposed Allotments for 1880-81.	
			Prior to receipt of Budget Orders.	After receipt of Budget Orders.
	IRRIGATION AND NAVIGATION.	RS.	RS.	RS.
	Works for which Capital and Revenue Accounts are kept.			
	Capital.			
Chingleput ...	Palar anicut channels	2,82,000	60,710	16,000
	Works for which Capital and Revenue Accounts are not kept.			
Do. ...	Madras water-supply and irrigation extension project	...	55,000	32,847
Salem	Penugoondapuram tank	69,000	20,000	10,000
	Agricultural.			
	River Embankments.			
Eastern Delta, Godávari.	Gowtami Godávari L. B., Rajahmundry to Yanam	57,990	5,000	3,800
...	Vasista Godávari L. B., to Gowtami aqueduct	34,400	10,000	5,000
Eastern Delta, Kistna.	Kistna L. B., below anicut	50,000	10,000	5,000
Nellore	Pennér R. B., from Narasimakonda to Pennér anicut	42,800	5,155	2,500
Do.	Do. from anicut to sea	61,450	5,850	2,500
Cuddapah ...	Cheyaur L. B., below railway ...	30,534	5,000	...
Coimbatore ...	Cauvery flood bank in connection with the L. B. of the Vangal channel ...	27,640	7,600	...
	Miscellaneous.			
Western Delta Kistna.	Tow-path Nizampatam salt creek ...	8,930	5,100	...

No. 2.

Statement showing the amounts allotted for Minor Original Works and Repairs, Agricultural, prior to receipt of Budget Orders for 1880-81, but reduced under those Orders.

MINOR ORIGINAL WORKS.

Divisions.	River Conservancy.		River Embankments.		Drainages.		Miscellaneous.		Total.	
	Prior to Budget Orders.	Reduced amounts.	Prior to Budget Orders.	Reduced amounts.	Prior to Budget Orders.	Reduced amounts.	Prior to Budget Orders.	Reduced amounts.	Prior to Budget Orders.	Reduced amounts.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Ganjam	..	..	1,000	1,000	..	..	..	..	1,000	1,000
Vizagapatam	..	..	..	..	..	..	..	..	..	..
Godávari Eastern Delta ..	..	..	..	..	..	..	500	500	500	500
Do. Western Delta ..	..	..	..	..	..	..	400	400	400	400
Kistna Eastern Delta ..	1,000	1,000	1,000	1,000	200	..	500	500	2,700	2,500
Do. Western Delta ..	..	..	..	..	..	..	500	500	500	500
Nellore	1,000	500	1,000	500	500	..	500	100	3,000	1,100
Cuddapah	..	..	500	500	..	..	300	300	800	800
Bellary	..	..	..	..	..	..	200	200	200	200
Chingleput	..	..	1,000	1,000	..	..	200	200	1,200	1,200
North Arcot	..	..	500	500	200	..	..	..	700	500
South Arcot	400	400	..	..	200	..	400	400	1,000	800
Salem	..	..	..	..	..	..	..	..	..	..
Coimbatore	3,000	1,000	1,000	1,000	..	..	..	..	4,000	2,000
Tanjore	500	500	2,000	2,000	500	..	200	200	3,200	2,700
Negapatam	..	..	..	..	500	..	100	100	600	100
Trichinopoly	..	..	..	..	1,000	..	..	..	1,000	..
Tinnevelly	..	..	5,000	2,000	500	..	..	..	5,500	2,000
Total ..	5,900	3,400	13,000	9,500	3,600	..	3,800	3,400	26,300	16,300
Reserve	..	..	..	..	..	..	..	..	3,700	3,700
Grand Total ..	..	..	..	..	..	..	..	..	30,000	20,000

REPAIRS.

Divisions.	River Conservancy.		River Embankments.		Drainages.		Total.	
	Prior to Budget Orders.	Reduced amounts.	Prior to Budget Orders.	Reduced amounts.	Prior to Budget Orders.	Reduced amounts.	Prior to Budget Orders.	Reduced amounts.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Ganjam	..	..	3,000	1,000	..	..	3,000	1,000
Vizagapatam	1,000	1,000	..	..	..	..	1,000	1,000
Godávari Eastern Delta ..	11,000	6,000	9,500	9,500	..	..	20,500	15,500
Do. Western Delta ..	4,000	4,000	500	500	200	..	4,700	4,500
Kistna Eastern Delta ..	1,500	1,500	2,000	2,000	200	..	3,700	3,500
Do. Western Delta ..	200	200	2,000	2,000	..	..	2,200	2,200
Nellore	1,000	..	2,000	1,000	500	..	3,500	1,000
Cuddapah	500	..	500	500	..	..	1,000	500
Bellary	..	..	..	..	..	..	..	..
Chingleput	1,000	..	3,000	1,000	..	..	4,000	1,000
North Arcot	1,000	..	1,000	500	500	..	2,500	500
South Arcot	3,000	1,000	3,000	1,000	500	..	6,500	2,000
Salem	3,000	1,000	..	..	..	..	3,000	1,000
Coimbatore	6,500	2,500	2,500	1,500	..	..	9,000	4,000
Tanjore	15,000	10,000	15,000	15,000	2,000	..	32,000	25,000
Negapatam	8,000	5,000	12,000	10,000	2,000	..	22,000	15,000
Trichinopoly	15,000	5,000	16,000	10,000	1,000	..	32,000	15,000
Tinnevelly	500	500	4,000	4,000	500	..	5,000	4,500
Total ..	72,200	37,700	76,000	59,500	7,400	..	1,55,600	97,200
Reserve	..	..	..	..	..	..	14,000	..
Grand Total ..	..	..	..	..	..	..	1,69,600	97,200

SCHEDULE B showing the distribution of Grants for Minor Original Works for 1880-81 by Divisions.

Circles.	Districts.	Divisions.	Irrigation and Navigation—Works for which Capital and Revenue Accounts are not kept.		Agricultural. River Conservancy.		River Embankments.		Drainages.		Miscellaneous.		Total.		Remarks.
			1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	
			RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	
I.	Ganjam	Ganjam	5,000	4,000	..	..	1,000	1,000	..	..	..	..	1,000	1,000	
	Vizagapatam	Vizagapatam	2,500	2,000	..	..	..	..	..	..	..	..	..	..	
	Godávari	Eastern and Central Delta.	..	7,000	..	..	..	..	..	..	500	500	500	500	
		Western Delta ..	..	..	..	..	..	..	..	..	400	400	400	400	
	Kistna	Eastern Delta ..	500	500	1,000	1,000	1,000	1,000	..	200	500	500	2,500	2,700	
		Western Delta ..	..	..	..	..	..	..	..	..	500	..	500	..	
II.	Kistna and Nellore ..	Guntúr	..	8,500	..	..	..	500	..	500	..	..	..	1,000	
	Nellore	Nellore	7,500	4,000	500	1,000	500	1,000	..	500	100	500	1,100	3,000	
	Cuddapah	Cuddapah	2,500	10,000	..	..	500	..	..	..	300	500	800	500	
	Kurnool	Kurnool	5,000	9,000	..	..	..	..	..	..	..	..	..	..	
	Bellary	Bellary	3,500	3,500	..	..	..	..	..	..	200	200	200	200	
		Anantapur	3,000	3,500	..	..	..	..	..	..	..	..	..	..	
III.	Chingleput	Chingleput	15,000	12,000	..	..	1,000	1,000	..	..	200	200	1,200	1,200	
	North Arcot	North Arcot	15,000	14,200	..	..	500	500	..	200	..	100	500	800	
	South Arcot	South Arcot	10,000	10,000	400	400	..	..	..	300	400	100	800	800	
IV.	Salem	Salem	10,000	14,000	..	..	..	..	..	..	..	..	..	..	
	Coimbatore	Coimbatore	8,800	7,000	1,000	2,000	1,000	1,000	..	..	..	..	2,000	3,000	
	Malabar	Malabar	500	500	..	..	..	..	..	..	..	..	..	..	
V.	Tanjore	Tanjore	2,000	1,000	500	500	2,000	1,000	..	300	200	200	2,700	2,000	
		Negapatam	2,000	1,500	..	500	..	500	..	200	100	..	100	1,200	
	Trichinopoly	Trichinopoly	6,000	6,000	..	..	..	..	..	1,000	..	300	..	1,300	
	Madura	Madura	3,000	6,000	..	..	..	..	..	..	..	..	..	..	
	Tinnevelly	Tinnevelly	8,000	10,000	..	1,000	2,000	16,000	..	500	..	..	2,000	17,500	
		Sátúr	2,000	10,000	..	..	..	..	..	..	..	..	..	..	
		Total ..	1,11,800	1,44,200	3,400	6,400	9,500	23,500	..	3,700	3,400	3,500	16,300	37,100	
	Reserve at the disposal of	Government	30,000	10,800	..	..	..	..	..	..	..	..	3,700	..	
		Grand Total ..	1,41,800	1,55,000	3,400	6,400	9,500	23,500	..	3,700	3,400	3,500	20,000	37,100	

SCHEDULE C showing the distribution of Grants for repairs to works of Irrigation and Navigations for which Capital and Revenue Accounts are not kept and to Agricultural Works for 1880-81.

Circles.	Districts.	Divisions.	Irrigation and Navigation—Works for which Capital and Revenue Accounts are not kept.		Agricultural.										Remarks.
					River Conservancy.		River Embankments.		Drainages.		Miscellaneous.		Total.		
			1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	1880-81.	1879-80.	
			RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	
I.	Ganjam	Ganjam	30,000	30,000	..	..	1,000	2,500	..	..	..	..	1,000	2,500	
	Vizagapatam	Vizagapatam	25,000	12,000	1,000	500	..	1,500	..	500	..	300	1,000	2,800	
	Godávari	Eastern and Central Delta	1,500	12,000	6,000	12,000	9,500	3,000	..	..	..	100	16,500	15,100	
		Western Delta	..	10,000	4,000	6,000	500	4,500	..	1,000	..	..	4,500	11,500	
	Kistna	Eastern Delta	3,000	3,000	1,500	1,000	2,000	1,000	..	200	..	100	3,500	2,300	
		Western Delta	..	..	200	..	2,000	..	..	..	..	200	2,200	200	
II.	Kistna and Nellore ..	Guntúr	5,000	7,000	..	500	..	1,500	..	800	..	100	..	2,900	
	Nellore	Nellore	50,000	60,000	..	1,000	2,000	2,000	..	500	..	..	1,000	3,500	
	Cuddapah	Cuddapah	25,000	45,000	..	500	500	1,500	..	..	..	300	500	2,300	
	Kurnool	Kurnool	25,000	25,000	..	..	..	..	..	..	..	..	..	..	
	Bellary	Bellary	20,000	20,000	..	..	..	..	..	..	..	..	..	..	
		Anantapur	20,000	20,000	..	..	..	..	..	..	..	..	..	..	
III.	Presidency	Presidency	3,000	3,000	..	..	..	..	..	..	..	..	..	..	
	Chingleput	Chingleput	70,000	78,210	..	1,500	1,000	3,000	..	..	..	300	1,000	4,800	
	North Arcot	North Arcot	70,000	80,000	..	1,000	500	1,000	..	500	..	100	500	2,600	
	South Arcot	South Arcot	90,000	1,06,000	1,000	3,000	1,000	3,000	..	400	..	200	2,000	6,600	
IV.	Salem	Salem	42,000	42,000	1,000	1,000	..	..	..	..	..	..	1,000	1,000	
	Coimbatore	Coimbatore	50,000	46,500	2,500	4,500	1,500	2,500	..	..	..	300	4,000	7,300	
	Malabar	Malabar	2,000	2,000	..	..	..	..	..	..	..	..	..	..	
	Tanjore	Tanjore	10,000	5,000	10,000	14,000	15,000	25,000	..	2,000	..	300	25,000	41,300	
		Negapatam	5,000	5,000	5,000	14,000	10,000	20,000	..	..	..	..	15,000	34,000	
	Trichinopoly	Trichinopoly	36,000	44,000	5,000	18,000	10,000	25,000	..	1,500	..	300	15,000	44,800	
	Madura	Madura	30,000	50,000	..	1,000	..	..	..	..	..	..	..	1,000	
	Tinnevelly	Tinnevelly	60,000	60,000	500	2,000	4,000	4,000	..	1,000	..	..	4,500	7,000	
		Sátúr	50,000	60,000	..	500	..	4,000	..	..	..	..	..	4,500	
		Total ..	7,22,500	8,25,710	37,700	82,000	59,500	1,05,000	..	8,400	..	2,600	97,200	1,98,000	
	Reserve at the disposal of Government		10,000	..	..	..	..	..	..	..	..	..	..	..	
		Grand Total ..	7,32,500	8,25,710	37,700	82,000	59,500	1,05,000	..	8,400	..	2,600	97,200	1,98,000	

PRELIMINARY ISSUE.

IRRIGATION PRODUCTIVE PUBLIC WORKS.

MADRAS PRESIDENCY.

PUBLIC WORKS DEPARTMENT.

IMPERIAL BUDGET ESTIMATE

OF

IRRIGATION WORKS

IN

MADRAS PRESIDENCY

FOR THE YEAR

1880-81.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

FORT ST. GEORGE,
26th December 1879.

REVENUE.

BUDGET ESTIMATE OF THE IMPERIAL REVENUE FROM IRRIGATION WORKS IN MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1880 TO 31ST MARCH 1881.

—	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Realisations, 1878-79.
Direct receipts to be included as Irrigation Revenue in the Finance Accounts of the P. W. Department.	Rs.	Rs.	Rs.	Rs.
Godavari Delta System.				
Realised in Public Works Department	93,500	75,500	84,500	96,867
Do. in Civil Department	16,45,000	16,20,000	16,18,000	...
Total ...	17,38,500	16,95,500	17,02,500	...
Kistna Delta System.				
Realised in Public Works Department	25,950	26,350	26,350	25,822
Do. in Civil Department	7,93,000	7,73,000	7,41,000	...
Total ...	8,18,950	7,99,350	7,67,350	...
Penner Anicut System.				
Realised in Public Works Department	250	252	400	201
Do. in Civil Department	2,00,000	1,99,000	1,60,000	...
Total ...	2,00,250	1,99,252	1,60,400	...
Cauvery Delta System.				
Realised in Public Works Department	9,000	9,000	9,000	4,857
Do. in Civil Department	26,00,000	26,00,000	25,62,000	...
Total ...	26,09,000	26,09,000	25,71,000	...
Srivaikuntham Anicut System.				
Realised in Public Works Department	1,500	2,000	1,500	447
Do. in Civil Department	1,48,000	1,46,000	1,33,000	...
Total ...	1,49,500	1,48,000	1,34,500	...
Total, Realised in Public Works Department ...	1,30,200	1,13,102	1,21,750	1,28,187
Do. do. in Civil Department	53,86,000	53,38,000	52,14,000	...
Grand Total ...	55,16,200	50,51,102	53,35,750	...

MEMORANDUM OF THE AMOUNTS TO BE CREDITED TO EACH SYSTEM ON ACCOUNT OF SHARE OF ENHANCED LAND REVENUE DUE TO, OR DEPENDENT ON THE WORKS.

None.

CHARGES.

ABSTRACT BUDGET ESTIMATE OF THE CHARGES FOR IRRIGATION WORKS IN MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1880 TO 31ST MARCH 1881.

—		References to detailed Estimates.	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Outlay, 1878-79.
CAPITAL OUTLAY.		Page.	Rs.	Rs.	Rs.	Rs.
A—CAPITAL PRODUCTIVE PUBLIC WORKS.	Rs.					
I.—Works ... { In progress ...	1,66,535					
Not commenced ..	...		1,66,535	1,45,834	2,11,021	1,07,858
II.—Establishment			46,302	40,598	58,703	1,21,210
III.—Tools and Plant			47,163	28,646	30,276	11,355
Total ...			2,60,000	2,15,078	3,00,000	2,40,423
Less refund from Ordinary and Provincial Grants.			1,50,000	1,00,000	1,50,000	50,000
Total—A—Cap. P. P. W. ...			1,10,000	1,15,078	1,50,000	1,90,423
B—ORDINARY PUBLIC WORKS.						
(Subsidiary Capital).	Rs.					
I.—Works ... { In progress ...	88,925					
Not commenced ...	...		88,925	1,13,055	75,990	37,952
II.—Establishment			28,352	31,979	24,137	11,436
III.—Tools and Plant			2,223	2,826	1,900	959
Total—B—Ordinary P. W. ...			1,19,500	1,47,860	1,02,027	50,347
TOTAL CAPITAL OUTLAY A + B. ...			2,29,500	2,62,938	2,52,027	2,40,770
REVENUE OUTLAY AND INTEREST.						
C—ORDINARY PRODUCTIVE PUBLIC WORKS.						
Working Expenses and Maintenance—	Rs.					
I-A.—Extensions and Improvements. { In progress ...	...					
Not commenced ...	...		23,000	22,500	22,500	20,837
I-B.—Maintenance and Repairs			3,45,000	3,98,892	3,97,692	4,08,841
II.—Establishment			2,09,983	2,15,362	2,21,436	2,12,122
III.—Tools and Plant			79,017	67,335	67,305	32,451
Total Working Expenses and Maintenance ...			6,57,000	7,04,089	7,08,933	6,74,251

CHARGES.

ABSTRACT BUDGET ESTIMATE OF THE CHARGES FOR IRRIGATION WORKS IN MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1880 TO 31ST MARCH 1881—*cont.*

—	References to detailed Estimates.	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Outlay, 1878-79.
REVENUE OUTLAY AND INTEREST—*cont.*	Page.	Rs.	Rs.	Rs.	Rs.
C—ORDINARY PRODUCTIVE PUBLIC WORKS—*cont.*					
Share of collection charges in Civil Department, being 7·2 per cent. on Gross Revenue		3,87,792	3,84,336	...	...
Interest on Capital Outlay		7,85,632	7,68,929	3,12,232	...
Total—C—Ordy. P. P. W. ...		18,30,424	18,57,354	10,21,165	6,74,251
TOTAL B + C.					
Works including Extensions and Improvements ...		1,11,925	1,35,555	98,490	58,789
Repairs including Maintenance		3,45,000	3,98,892	3,97,692	4,08,841
Establishment		2,38,335	2,47,341	2,45,573	2,23,558
Tools and Plant		81,240	70,161	69,205	33,410
Total ...		7,76,500	8,51,949	8,10,960	7,24,578
Share of collection charges in Civil Department ...		3,87,792	3,84,336	...	...
Interest on Capital Outlay		7,85,632	7,68,929	3,12,232	...
Total ...		19,49,924	20,05,214	11,23,192	7,24,598
GRAND TOTAL, IRRIGATION WORKS A+B+C.					
Works		2,78,460	2,81,389	3,09,511	1,66,647
Repairs		3,45,000	3,98,892	3,97,692	4,08,841
Establishment		2,84,637	2,87,939	3,04,276	3,44,768
Tools and Plant		1,28,403	98,807	99,481	44,765
Total ...		10,36,500	10,67,027	11,10,960	9,65,021
Less refund from Ordinary and Provincial Grants.		1,50,000	1,00,000	1,50,000	50,000
Total ...		8,86,500	9,67,027	9,60,960	9,15,021
Collection charges in Civil Department		3,87,792	3,84,336	...	...
Interest on Capital Outlay		7,85,632	7,68,929	3,12,232	...
GRAND TOTAL ..		20,59,924	21,20,292	12,73,192	9,15,021

CHARGES.

PART I.

BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION WORKS IN THE MADRAS PRESIDENCY, FOR THE YEAR 1880-81, ARRANGED BY SYSTEMS.

—	Amount of Estimate.	Actual Outlay to end of 1878-79.	Probable Outlay during 1879-80, (Regular Estimate).	Budget Estimate, 1879-80.	Budget Estimate, 1880-81.	Remarks and References.
CAPITAL OUTLAY.	Rs.	Rs.	Rs.	Rs.	Rs.	
A—CAPITAL PRODUCTIVE PUBLIC WORKS.						
Works in Progress.						
Godávari Delta System... ...	28,12,128	*27,90,680	1,70,405	2,27,345	2,08,000	* Exclusive of Rs. 10,128 debited to Ordinary Funds. Amount of sanctions given by the Govt. of India in their letter — Rs. No. 108 I, of 2nd March 1871 .. 9,45,400 No. 181 I, of 20th May 1871 .. 1,35,400 No. 367 I, of 2nd Aug. 1871 .. 13,04,640 No. 217 I, of 14th April 1874 .. 2,33,200 No. 120 A I, of 18th April 1874 .. 1,91,560 No. 279 I, of 30th June 1876 .. —27,780 No. 158 I, of 15th June 1877 .. 13,573 No. 30 I, of 30th June 1878 .. 3,285 No. 371 I, of 18th Oct. 1878 .. } Proceedings, Madras Government, No. 327 I, of 2nd June 1879 .. } 12,850 Total .. 28,12,128 The estimates as sanctioned do not include provision for Establishment charges for which sanction has been applied for—*Vide* Proceedings, Madras Government, No. 670 I, of 6th November 1879.
Kistna Delta System	7,96,498	10,14,752	26,594	43,449	13,000	Amount of sanctions given by the Government of India in their letter — Rs. No. 132 A I, of 1st Sept. 1868.. 49,860 No. 132 A I, of 1st Sept. 1868.. 1,87,990 No. 132 A I, of 1st Sept. 1868, & No. 163 I, of 25th Oct. 1867. 4,14,193 No. 130 I, of 24th April 1871.. 1,13,530 No. 43 I, of 21st Feb. 1878 .. 20,990 No. 14 I, of 25th Jan. 1877 .. 9,640 No. 54 I, of 8th April 1879 .. 295 7,96,498 The estimates as sanctioned do not include provision for Establishment charges for which sanction has been applied—*Vide* Proceedings, Madras Government, No. 629 I, dated 12th August 1878.
Cauvery Delta System... ...	...	...	257	...	...	
Srivaikuntham Anicut System...	11,53,027	†11,79,959	17,822	29,206	39,000	† Exclusive of Rs. 2,806 debited to Ordinary Funds. Government of India Register No. 65 I, of 1875-76. G.O., No. 270 I, of 29th January 1876 .. .. Rs. 11,19,587 Government of India Register No. 3 I, of 1879-80. G.O., No. 553 I, dated 22nd September 1879 .. 33,440 11,53,027 Revised estimates will be submitted.
Total—A—Capital P. ..	...	..	2,15,078	3,00,000	2,60,000	
Less met by refund from Ordinary and Provincial Grants.	...	...	1,00,000	1,50,000	1,50,000	
TOTAL—A—CAPITAL PRODUCTIVE PUBLIC WORKS.	...	...	1,15,078	1,50,000	1,10,000	

CHARGES.

PART I—cont.

BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION WORKS IN THE MADRAS PRESIDENCY, FOR THE YEAR 1880-81, ARRANGED BY SYSTEMS—*cont.*

——	Amount of Estimate.	Actual Outlay to end of 1878-79.	Probable Outlay during 1879-80, (Regular Estimate).	Budget Estimate, 1879-80.	Budget Estimate, 1880-81.	Remarks and References.
CAPITAL OUTLAY—cont.	Rs.	Rs.	Rs.	Rs.	Rs.	
B—ORDINARY PUBLIC WORKS.						
(Subsidiary Capital.)						
Works in Progress.						Rs.
Godávari Delta System ...	29,675	35,284	17,420	11,382	6,000	G.O., No. 283 I, of 1st Sept. 1877. 1,675 ,, ,, 2,692, of 24th Sept. 1875. 750 ,, ,, 73 I, of 25th Jan. 1878. 8,700 ,, ,, 228 I, of 18th Mar. 1878. 9,900 ,, ,, 405 I, of 13th May 1878. 8,650 29,675
Kistna Delta System	4,73,806	2,16,631	1,04,344	63,480	95,000	G.O., No. 2,598, of 31st Oct. 1870. 46,420 ,, ,, 1,911, of 15th July 1874. 3,905 ,, ,, 636, of 5th Mar. 1875. 14,170 ,, ,, 3,408, of 30th Nov. 1875. 9,050 ,, ,, 365, of 11th Feb. 1876. 2,875 ,, ,, 213 I, of 3rd Aug. 1877. 22,100 ,, ,, 78 I, of 28th Jan. 1878. 2,104 ,, ,, 132 I, of 14th Feb. 1878. 5,795 ,, ,, 133 I, of 14th Feb. 1878. 830 ,, ,, 265 I, of 26th Mar. 1878. 11,007 ,, ,, 257 I, of 3rd April 1879. 3,55,550 4,73,806
Pennér Anicut System	1,74,750	2,29,818	4,041	5,020	1,000	G.O., No. 1,738, of 19th June 1875 and No. 1,134, of 8th May 1876. 1,59,150 G.O., No. 2,604, of 27th Sept. 1876. 15,600 1,74,750 Revised estimates were submitted to Government of India, but not sanctioned for want of certain information.—*Vide* Proceedings of Madras Government, No. 287 I, dated 3rd September 1877.
Cauvery Delta System	42,960	17,744	22,055	22,145	17,500	Rs. G.O., No. 374 I, of 4th Oct. 1877. 31,380 ,, ,, 70 I, of 25th Jan. 1878. 11,580 42,960
Total—B—Ordy. P. W. ..	...	...	1,47,860	1,02,027	1,19,500	
REVENUE OUTLAY.						
C—ORDINARY PRODUCTIVE PUBLIC WORKS.						
Working Expenses and Maintenance—						
Godávari Delta System ...	...	...	3,18,464	3,17,513	2,86,500	
Kistna Delta System ...	...	...	1,94,432	1,95,318	2,07,000	
Pennér Anicut System ...	...	...	43,736	42,166	28,500	
Cauvery Delta System ...	...	...	1,07,356	1,07,839	88,500	
Srivaikuntham Anicut System	...	...	34,101	34,097	33,500	
Special Revenue Investigation	...	...	6,000	12,000	13,000	
Total Working Expenses and Maintenance.	...	...	7,04,089	7,08,933	6,57,000	

CHARGES.

PART I—cont.

BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION WORKS IN THE MADRAS PRESIDENCY, FOR THE YEAR 1880-81, ARRANGED BY SYSTEMS—*cont.*

—	Amount of Estimate.	Actual Outlay to end of 1878-79.	Probable Outlay during 1879-80, (Regular Estimate).	Budget Estimate, 1879-80.	Budget Estimate, 1880-81.	Remarks and References.
REVENUE OUTLAY—cont.	Rs.	Rs.	Rs.	Rs.	Rs.	
C—ORDINARY PRODUCTIVE PUBLIC WORKS—cont.						
Share of Collection Charges in Civil Department being 7·2 per cent. on Gross Revenue.						
Godávari Delta System ...	...	...	1,16,640	...	1,18,440	
Kistna Delta System	...	...	55,656	...	57,096	
Pennér Anicut System	...	...	14,328	...	14,400	
Cauvery Delta System	...	...	1,87,200	...	1,87,200	
Srivaikuntham Anicut System ..	...	...	10,512	...	10,656	
Total ...	...	...	3,84,336	...	3,87,792	
Interest on Capital Outlay.						
Godávari Delta System ...	...	...	3,67,135	1,42,902	3,76,175	
Kistna Delta System	...	...	2,21,183	71,292	2,26,561	
Pennér Anicut System... ...	...	...	63,284	24,594	63,397	
Cauvery Delta System	...	...	63,700	19,175	64,595	
Srivaikuntham Anicut System...	...	...	53,627	54,269	54,904	
Total ...	...	...	7,68,929	3,12,232	7,85,632	
Total—C—Ordy. P. P. W. ..	...	...	18,57,354	10,21,165	18,30,424	
GRAND TOTAL.						
Charges in the Public Works Department.	...	...	9,67,027	9,60,960	8,86,500	
Share of Collection Charges in the Civil Department.	...	...	3,84,336	...	3,87,792	
Interest on Capital Outlay.	...	...	7,68,929	3,12,232	7,85,632	
GRAND TOTAL ..	...	...	21,20,292	12,73,192	20,59,924	

CHARGES.

PART I—cont.

ABSTRACT OF CHARGES TO BE INCURRED FROM IMPERIAL FUNDS AND CONTRIBUTIONS.

—	Budget Estimate, 1880-81. Works. In progress.	Not commenced.	Total.	Repairs.	Establishment.	Tools and Plant.	Share of Collection Establishment.	Interest on Capital Outlay.	Total.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Outlay, 1878-79.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Cap. P.P.W.												
In India ...	1,66,535	...	1,66,535	...	46,302	47,163	...	...	2,60,000	2,15,078	3,00,000	2,40,423
In England.	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	1,66,535	...	1,66,535	..	46,302	47,163	..	...	2,60,000	2,15,078	3,00,000	2,40,423
Ordy. P.W.												
In India ...	88,925	...	88,925	...	28,352	2,223	...	...	1,19,500	1,47,860	1,02,027	50,347
In England.		...	...	...	...	...	...	...	...	...	...	...
Total ...	88,925	...	88,925	...	28,352	2,223	..	...	1,19,500	1,47,860	1,02,027	50,347
Ordy. P.P.W.												
In India ...	...	...	23,000	3,45,000	2,09,983	79,017	3,87,792	4,72,363	15,17,155	15,54,774	7,08,933	6,74,251
In England.	...	...	...	...	...	..	...	3,13,269	3,13,269	3,02,580	3,12,232	...
Total ...	...	...	23,000	3,45,000	2,09,983	79,017	3,87,792	7,85,632	18,30,424	18,57,354	10,21,165	6,74,251
Total ...	...	...	2,78,460	3,45,000	2,84,637	1,28,403	3,87,792	7,85,632	22,09,924	22,20,292	14,23,192	9,65,021
From Contributions.												
Grand Total.	...	...	2,78,460	3,45,000	2,84,637	1,28,403	3,87,792	7,85,632	22,09,924	22,20,292	14,23,192	9,65,021

N.B.—Under the arrangements sanctioned in G.O., No. 835 I, dated 19th October 1878, all English stores are in the first instance debited to Provincial and afterwards sold to Irrigation at cost price. No expenditure in England is therefore shown except in the column "Interest on Capital Outlay."

BUDGET ESTIMATE OF EXPENDITURE IN ENGLAND ON IRRIGATION WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR 1880-81 ARRANGED BY SYSTEMS.

—	Budget Estimate 1880-81, Interest on Outlay on Capital Productive Public Works.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Outlay, 1878-79.
	Rs.	Rs.	Rs.	Rs.
ORDINARY PRODUCTIVE PUBLIC WORKS.				
Godávari Delta System	1,45,705	1,37,191	1,42,902	...
Kistna do.	69,275	68,383	71,292	...
Pennér Anicut System	24,325	24,325	24,594	...
Cauvery Delta System	19,187	19,181	19,175	...
Srivaikuntham Anicut System	54,777	53,500	54,269	...
Total ...	3,13,269	3,02,580	3,12,232	...

CHARGES.

PART IV.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT OF THE IRRIGATION BRANCH IN THE MADRAS PRESIDENCY FOR THE YEAR 1880-81.

Number. 1879-80.	Number. 1880-81.	Particulars.	Rate of Salary.	1880-81. Per Mensem.	1880-81. Per Annum.	1880-81. Total.	1879-80.
			Rs.	Rs.	Rs.	Rs.	Rs.
		GODAVARI DELTA SYSTEM.					
		Water Regulation.					
1	1	Anicut Superintendent	120	120	1,440		
27	27	Delta Superintendents	40 to 70	1,380	16,560		
3	3	Maistries	12 to 18	45	540		
3	3	Clerks	15	45	540		
6	6	Superintendents	8	48	576		
115	115	Lascars	5 to 6	612	7,344		
1	1	Shroff	10	10	120		
					27,120		
		Travelling allowance	...	...	1,763		
					28,883		
		Additional Establishment proposed but not sanctioned.					
1	1	Superintendent	8	8	96		
1	3	Lascars	6	18	216		
					312	29,195	29,051
		Navigation Establishment.					
1	1	Boat Superintendent	75	75	900		
49	49	Lock Superintendents	8 to 15	507	6,084		
203	203	Lascars	5 to 6	1,149	13,788		
					20,772		
		Additional Establishment proposed but not sanctioned.					
2	2	Lascars	5	10	120	20,892	20,892
		Total, Godávari Delta System ...	...	...	...	50,087	49,943
		KISTNA DELTA SYSTEM.					
		Water Regulation.					
1	1	Anicut Superintendent	100	100	1,200		
14	14	Delta Superintendents	40 to 70	725	8,700		
1	1	Anicut Maistry	30	30	360		
2	2	Clerks	12 to 15	27	324		
3	3	Superintendents for 6 months	10	30	180		
93	93	Lascars	5 to 8	587	7,044		
23	23	Do. for 6 months	6	138	828		
					18,636		
		Travelling allowance	...	...	744	19,380	19,380
		Navigation Establishment.					
16	16	Lock Superintendents	10 to 15	189	2,268		
56	56	Lascars	5 to 8	356	4,272		
1	1	Traffic Gumasta, increase of pay for 9 months.	5	5	45		
					6,585		

CHARGES.

PART IV—*cont.*

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT OF THE IRRIGATION BRANCH IN THE MADRAS PRESIDENCY FOR THE YEAR 1880-81—*cont.*

Number. 1879-80.	Number. 1880-81.	Particulars.	Rate of Salary.	1880-81. Per Mensem.	1880-81. Per Annum.	1880-81. Total.	1879-80.
		KISTNA DELTA SYSTEM.	Rs.	Rs.	Rs.	Rs.	Rs.
		Additional Establishment proposed but not sanctioned.					
...	1	Superintendent	12	12	144		
...	4	Lascars	5 to 8	26	312		
					456	7,041	6,585
		Total, Kistna Delta System ...	...	...	...	26,421	25,965
		PENNER ANICUT SYSTEM.					
		Water Regulation.					
1	1	Delta Superintendent	70	70	840		
1	1	Anicut do.	60	60	720		
2	2	Clerks	10 & 15	25	300		
22	22	Lascars	5 to 7	129	1,548		
5	5	Superintendents for 7 months	8 to 12	48	336		
18	18	Lascars for do.	5	90	630		
						4,374	4,374
		CAUVERY DELTA SYSTEM.					
		Water Regulation.					
17	17	Superintendents	7 to 17½	181½	2,178		
127	127	Lascars	4 to 6	564	6,768		
					8,946		
		Navigation Establishment.					
1	1	Superintendent	8	8	96		
1	1	Lascar	5	5	60		
					156	9,102	9,102
		SRIVAIKUNTHAM ANICUT SYSTEM.					
		Water Regulation.					
2	2	Maistries	30	60	720		
1	1	Superintendent	12	12	144		
21	21	Lascars	5	105	1,260		
3	3	Do. for 3 months	5	15	45	2,169	2,169
		Special Establishment for Revenue Investigation.					
1	1	Manager	350	350	4,200		
...	24	Accountants	20 to 50	570	6,840		
17	2	Clerks	20 & 35	55	660		
...	1	Moochi	12	12	144		
...	1	Attender	10	10	120		
...	1	Peon	8	8	96		
1	...	Hospital Assistants	...	...	...		
10	...	Office Servants	...	...	...		
...	...	Travelling allowances and contingencies.	...	...	940	13,000	12,000

CHARGES.

PART IV—cont.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT OF THE IRRIGATION BRANCH IN THE MADRAS PRESIDENCY FOR THE YEAR 1880-81—*cont.*

Number.		Particulars.	Rate of Salary.	1880-81.			1879-80.
1879-80.	1880-81.			Per Mensem.	Per Annum.	Total.	
		SRIVAIKUNTHAM ANICUT SYSTEM—*cont.*	Rs.	Rs.	Rs.	Rs.	Rs.
		Special Establishment for Revenue Investigation—*cont.*					
...	...	Temporary Survey Establishments to be sanctioned in detail as may be required.	...	...	...	4,000	4,000
...	...	Portion of Chief Engineer's Establishment.	...	...	...	19,619	19,923
...	...	Share of Public Works Establishment at 25 per cent. on grant for works and repairs.	...	...	...	1,55,865	1,76,800
		Total ...	..	...	...	2,84,637	3,04,276

PART VII.

ABSTRACT OF THE PROBABLE INCREASE OR DECREASE IN THE SUSPENSE ACCOUNTS OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR 1880-81.

—	Estimate, 1880-81.	Estimate, 1879-80.
None.		
All suspense accounts are treated as Provincial.		

APPENDIX A.

ACTUAL AND ESTIMATED CAPITAL ACCOUNT OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1880-81.

—	Direct Charges.			Indirect Charges.					
	Capital Productive Public Works.	Ordinary Public Works.	Total.	Capitalization of abatement of Land Revenue.	Exchange on Payments in England.	Leave and Pension Allowances.	Interest.	Total.	Grand Total.
Godávari Delta System.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Old outlay	1,72,816	50,65,865	52,38,681						
Outlay against current sanctions.	27,90,680	35,284	28,25,964						
Total actual outlay to end of 1878-79.	29,63,496	51,01,149	80,64,645						
Probable outlay during 1879-80.	1,70,405	17,420	1,87,825						
Proposed outlay during 1880-81.	2,08,000	6,000	2,14,000						
Total ...	33,41,901	61,24,569	84,66,470						
Kistna Delta System.									
Old outlay	4,91,588	31,26,767	36,18,355						
Outlay against current sanctions.	10,14,752	2,16,631	12,31,383						
Total actual outlay to end of 1878-79.	15,06,340	33,43,398	48,49,738						
Probable outlay during 1879-80.	26,594	1,04,344	1,30,938						
Proposed outlay during 1880-81.	13,000	95,000	1,08,000						
Total ...	15,45,934	35,42,742	50,88,676						
Pennér Anicut System.									
Old outlay	8,066	6,33,916	6,41,982						
Outlay against current sanctions.	5,32,498	2,29,818	7,62,316						
Total actual outlay to end of 1878-79.	5,40,564	8,63,734	14,04,298						
Probable outlay during 1879-80.	...	4,041	4,041						
Proposed outlay during 1880-81.	...	1,000	1,000						
Total ...	5,40,564	8,68,775	14,09,339						
Cauvery Delta System.									
Old outlay	1,65,823	9,36,212	11,02,035						
Outlay against current sanctions.	2,60,289	42,065	3,02,354						
Total actual outlay to end of 1878-79.	4,26,112	9,78,277	14,04,389						
Probable outlay during 1879-80.	257	22,055	22,312						
Proposed outlay during 1880-81.	...	17,500	17,500						
Total ...	4,26,369	10,17,832	14,44,201						

APPENDIX—A—cont.

ACTUAL AND ESTIMATED CAPITAL ACCOUNT OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1880-81—*cont.*

——	Direct Charges.			Indirect Charges.					
	Capital Productive Public Works.	Ordinary Public Works.	Total.	Capitalization of abatement of Land Revenue.	Exchange on Payments in England.	Leave and Pension Allowances.	Interest.	Total.	Grand Total.
Srivaikuntham Anicut System.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Old outlay	...	...	...						
Outlay against current sanctions.	11,79,959	2,806	11,82,765						
Total actual outlay to end of 1878-79.	11,79,959	2,806	11,82,765						
Probable outlay during 1879-80.	17,822	...	17,822						
Proposed outlay during 1880-81.	39,000	...	39,000						
Total ...	12,36,781	2,806	12,39,587						
GRAND TOTAL ...	70,91,546	105,56,725	1,76,48,270						

N.B.—The Examiner states that the information required to fill in the columns under Indirect charges is not available.

APPENDIX B.

ACTUAL AND ESTIMATED REVENUE ACCOUNT OF IRRIGATION WORKS IN THE MADRAS PRESIDENCY TO END OF 1880-81.

——	Probable Receipts, 1880-81.			Probable Expenses during 1880-81.	Balance, Surplus or Deficit, 1880-81.	Probable Net Surplus or Deficit for 1879-80.	Actual Net Surplus or Deficit to end of 1878-79.	Probable Net Surplus or Deficit to end of 1880-81.
	Direct Receipts.	Share of Land Revenue.	Total.					
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System.	17,38,500	...	17,38,500	4,04,940	13,33,560	12,60,396		
Kistna Delta System.	8,18,950	...	8,18,950	2,64,096	5,54,854	5,49,262		
Pennér Anicut System.	2,00,250	...	2,00,250	42,900	1,57,350	1,41,188		
Cauvery Delta System.	26,09,000	...	26,09,000	2,75,700	23,33,300	23,14,444		
Srivaikuntham Anicut System.	1,49,500	...	1,49,500	44,156	1,05,344	1,03,387		
Total ...	55,16,200	...	55,16,200	10,31,792	44,84,408	43,68,677		

N.B.—The Examiner states that the information required to fill in the last two columns is not available.

APPENDIX C.

ACTUAL AND ESTIMATED INTEREST ACCOUNT OF THE SYSTEMS IN THE MADRAS PRESIDENCY TO END OF 1880-81.

——	Actual charges for Interest to end of 1878-79.	Probable charges for interest for 1879-80.	Probable charges for Interest for 1880-81.	Total to end of 1880-81.	Net Surplus or Deficit from Appendix B.	Balance of interest charges remaining unpaid to end of 1880-31.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Godávari Delta System		3,67,135	3,76,175			
Kistna do. do.		22,183	2,26,561			
Pennér Anicut do.		63,284	63,397			
Cauvery Delta do.		63,700	64,595			
Srivaikuntham Anicut System		53,627	54,904			
Total ...	...	7,68,929	7,85,632			

N.B.—The Examiner states that the information required to fill in the first and last three columns is not available.

PRELIMINARY ISSUE.

IRRIGN. AND NAVIGN. AND AGRICL. ORDINARY. **MADRAS PRESIDENCY.**

PUBLIC WORKS DEPARTMENT.

IMPERIAL BUDGET ESTIMATE

OF

IRRIGATION & NAVIGATION & AGRICULTURAL WORKS

IN

MADRAS PRESIDENCY

FOR THE YEAR

1880-81.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

FORT ST. GEORGE,
26th December 1879.

REVENUE.

BUDGET ESTIMATE OF THE IMPERIAL REVENUE FROM IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1880 TO 31ST MARCH 1881.

—	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Realisations, 1878-79.
Direct receipts to be included as Revenue from IRRIGATION and NAVIGATION in the Finance Accounts of the Public Works Department.	Rs.	Rs.	Rs.	Rs.
Works for which Capital and Revenue Accounts are kept.				
Chembrambaukum Tank.				
Realised in the Public Works Department	20	7	5	18
Do. in Civil Department				
Total ...				
Palar Anicut System.				
Realised in the Public Works Department	550	400	195	188
Do. in Civil Department				
Total ...				
Pelandorai Anicut System.				
Realised in the Public Works Department	50	50	50	
Do. in Civil Department				
Total ...				
Total for Works for which Capital and Revenue Accounts are kept.				
Realised in Public Works Department	620	457	250	206
Do. in Civil Department				
Total ...				
Works for which neither Capital nor Revenue Accounts are kept.				
Realised in the Public Works Department	15,000	15,000	15,000	15,473
Do. in Civil Department				
Total ...				
Total Irrigation and Navigation Works.				
Realised in Public Works Department	15,620	15,457	15,250	15,679
Do. in Civil Department				
Total ...				

MEMORANDUM OF THE AMOUNTS TO BE CREDITED TO EACH SYSTEM OF CANALS ON ACCOUNT OF SHARE OF ENHANCED LAND REVENUE DUE TO, OR DEPENDENT ON, THE WORKS.

None.

CHARGES.

ABSTRACT BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1880 TO 31ST MARCH 1881.

—	Reference to Detailed Estimate.	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Outlay, 1878-79.
WORKS OF IRRIGATION AND NAVIGATION.	Page.	Rs.	Rs.	Rs.	Rs.
Works for which Capital and Revenue Accounts are kept.					
A.—Capital.					
I.—Works ... In progress ... ... Rs. 39,390; Not commenced		39,390	55,867	40,681	7,688
II.—Establishment		11,125	17,004	11,815	2,112
III.—Tools and Plant		985	1,397	1,017	194
Refund to Capital Productive Public Works ...		50,000	...	50,000	...
State Outlay on Guaranteed Irrigation Works ...		8,000	7,376	7,376	5,845
Total A—Capital ...		1,09,500	81,644	1,10,889	15,839
B.—Revenue.					
I-A.—Extensions and Improvements. In progress ... ... Rs. ...; Not commenced		6,000	7,500	7,500	1,617
I-B.—Maintenance and Repairs		25,000	43,350	43,350	31,150
II.—Establishment		14,025	18,197	18,689	13,239
III.—Tools and Plant		975	1,271	1,271	828
Total ...		46,000	70,318	70,810	46,834
Share of Collection Charges in the Civil Department					
Total, B.—Revenue ...					
Total Works for which Capital and Revenue Accounts are kept					
Works for which neither Capital nor Revenue Accounts are kept.					
Works ... In progress ... ... Rs. ...; Not commenced		2,21,800	2,16,754	1,91,787	6,26,508
Repairs		7,32,500	7,54,369	8,25,710	6,09,131
Establishment		2,96,842	3,00,097	3,09,863	4,64,365
Tools and Plant		23,858	25,046	25,937	40,785
		12,75,000	12,96,266	13,53,297	17,40,789
Share of Collection Charges in Civil Department.					
Total Works for which neither Capital nor Revenue Accounts are kept					
Total Works of Irrigation and Navigation.					
Charges in the Public Works Department		14,30,500	14,40,228	15,34,996	18,03,462
Collection Charges in the Civil Department					
Total ...					

CHARGES.

ABSTRACT BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN THE MADRAS PRESIDENCY FOR THE YEAR FROM 1ST APRIL 1880 TO 31ST MARCH 1881—*cont.*

—	Reference to Detailed Estimates.	Budget Estimate, 1880-81.	Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Outlay, 1878-79.
AGRICULTURAL WORKS.	Page.	Rs.	Rs.	Rs.	Rs.
Works for which neither Capital nor Revenue Accounts are kept. Rs.					
Works ... In progress					
Works ... Not commenced					
		53,800	1,01,803	50,990	12,898
Repairs		97,200	1,89,307	1,98,000	1,60,005
Establishment		45,225	83,609	71,829	66,659
Tools and Plant		3,775	7,278	6,225	5,707
Total Agricultural Works ...		2,00,000	3,81,997	3,27,044	2,45,269
GRAND TOTAL OF IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS. Rs.					
Works ... In progress					
Works ... Not commenced					
		3,20,990	3,81,924	2,90,958	6,48,711
Repairs		8,54,700	9,87,026	10,67,060	8,00,286
Establishment		3,67,217	4,18,907	4,12,197	5,46,375
Tools and Plant		29,593	34,992	34,410	47,514
Refund to Capital Productive Public Works ...		50,000	...	50,000	...
State Outlay on Guaranteed Irrigation Works ...		8,000	7,376	7,376	5,845
Total ...		16,30,500	18,30,225	18,62,000	20,48,731
Collection Charges in the Civil Department					
Grand Total ...					

CHARGES.

PART I.

BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN MADRAS PRESIDENCY FOR THE YEAR 1880-81 ARRANGED BY SYSTEMS OF CANALS AND OBJECTS OF WORK.

——	Amount of Estimate.	Actual Outlay to end of 1878-79.	Probable Outlay during 1879-80 (Regular Estimate).	Budget Estimate, 1879-80.	Budget Estimate, 1880-81.	Remarks and References.
	Rs.	Rs.	Rs.	Rs.	Rs.	
WORKS OF IRRIGATION AND NAVIGATION.						
Works for which Capital and Revenue Accounts are kept.						
CAPITAL.						
Works in progress.						
Chembrambakam Tank ...	*6,55,310	†5,62,331	65,384	95,766	50,000	* Proceedings of Madras Government, No. 568 I, of 30th September 1879. † Inclusive of Rs. 2,12,816 debited to Loan funds. The budget provision of Rs. 50,000 is intended to recoup expenditure incurred from Loan funds and therefore does not appear in Appendix A.
Pálár Anicut System ...	2,89,460	11,943	8,360	7,407	21,000	RS. G.O., No. 509 I, of 20th November 1877 .. .. .. 5,300 G.O., No. 715 I, of 10th September 1878 .. .. .. 2,82,000 G.O., No. 79 I, of 28th January 1878 .. .. 2,160 2,89,460
Pelandorai Anicut System...	3,36,338	2,71,691	524	340	30,500	G.O., No. 407 I, of 15th May 1878 .. .. 3,33,518 G.O., No. 642 I, of 16th August 1878 .. .. .. 2,820 3,36,338
Madras Irrigation and Canal Company's Canal ...	...	...	7,376	7,376	8,000	
Total Capital ...	...	...	81,644	1,10,889	1,09,500	
REVENUE.						
Working Expenses and Maintenance.						
Chembrambakam Tank System.	...	...	6,578	11,790	8,000	
Pálár Anicut System ...	...	...	45,725	46,218	29,500	
Pelandorai Anicut System...	...	...	18,015	12,802	8,500	
Total ...	...	...	70,318	70,810	46,000	
Share of Collection Charges in Civil Department.						
Chembrambakam Tank ...						
Palar Anicut System ...						
Pelandorai Anicut System..						
Total ...						
Total Revenue ...						

CHARGES.

PART I—cont.

BUDGET ESTIMATE OF EXPENDITURE ON IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN MADRAS PRESIDENCY FOR THE YEAR 1880-81 ARRANGED BY SYSTEMS OF CANALS AND OBJECTS OF WORK—*cont.*

——	Amount of Estimate.	Actual Outlay to end of 1878-79.	Probable Outlay during 1879-80 (Regular Estimate).	Budget Estimate, 1879-80.	Budget Estimate, 1880-81.	Remarks and References.
	Rs.	Rs.	Rs.	Rs.	Rs.	
WORKS OF IRRIGATION AND NAVIGATION—cont.						
Works for which neither Capital nor Revenue Accounts are kept.						
Charges in Public Works Department.	...	...	12,96,266	13,53,297	12,75,000	
Share of Collection Charges in Civil Department.						
Total ...						
TOTAL IRRIGATION AND NAVIGATION WORKS.						
Charges in Public Works Department.	...	...	14,48,228	15,34,996	14,30,500	
Share of collection charges in Civil Department.						
Total ...						
AGRICULTURAL.						
Works for which neither Capital nor Revenue Accounts are kept.	...	...	3,81,997	3,27,044	2,00,000	
GRAND TOTAL.						
Charges in Public Works Department.	...	...	18,30,225	18,62,040	16,30,500	
Share of collection charges in Civil Department.						
Grand Total ...						

CHARGFS.

PART I—cont.

ABSTRACT OF CHARGES TO BE INCURRED FROM IMPERIAL FUNDS AND CONTRIBUTIONS.

—	Budget Estimate, 1880-81.									Regular Estimate, 1879-80.	Budget Estimate, 1879-80.	Actual Outlay in 1878-79.
	Works.			Repairs.	Establishment.	Tools and Plant.	Refund to Capital Productive Public Works.	State Outlay on Guaranteed Works.	Total.			
	In progress.	Not commenced.	Total.									
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Works of Irrigation and Navigation.												
In India ...	...	...	2,67,190	7,57,500	3,21,692	26,118	50,000	8,000	14,30,500	14,48,228	15,34,996	18,03,462
In England..	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	...	...	2,67,190	7,57,500	3,21,692	26,118	50,000	8,000	14,30,500	14,48,228	15,34,996	18,03,462
From Contributions.												
Total ...	...	...	2,67,190	7,57,500	3,21,692	26,118	50,000	8,000	14,30,500	14,48,288	15,34,996	18,03,462
Share of Collection Charges in Civil Department.												
Total ...												
Agricultural Works.												
In India ...	...	...	53,800	97,200	45,225	3,775	...	...	2,00,000	3,81,997	3,27,044	2,45,269
In England..	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	...	...	53,800	97,200	45,225	3,775	...	...	2,00,000	3,81,997	3,27,044	2,45,269
From Contributions.												
Total ...	...	...	53,800	97,200	45,225	3,775	...	...	2,00,000	3,81,997	3,27,044	2,45,269
Grand Total.	...	...	3,20,990	8,54,700	3,66,917	3,25,473	50,000	8,000	16,30,500	18,30,225	18,62,040	20,48,731

BUDGET ESTIMATE OF EXPENDITURE IN ENGLAND ON IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN MADRAS PRESIDENCY FOR THE YEAR 1880-81 ARRANGED BY SYSTEMS OF CANALS AND OBJECTS OF WORK.

None.

CHARGES.

PART IV.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT OF THE IRRIGATION DEPARTMENT FOR THE YEAR 1880-81.

Number. 1879-80.	Number. 1880-81.	Particulars.	Rate of Salary.	1880-81. Per Mensem.	1880-81. Per Annum.	1880-81. Total.	1879-80.
		IRRIGATION AND NAVIGATION.	Rs.	Rs.	Rs.	Rs.	Rs.
		CHEMBRAMBAUKAM TANK SYSTEM.					
		Water Regulation.					
2	2	Superintendents	10½ to 12	22½	270		
7	7	Lascars	5 to 6	37	444	714	714
		PALAR ANICUT SYSTEM.					
		Water Regulation.					
5	5	Superintendents	12 to 25	76	912		
1	1	Maistry	20	20	240		
29	29	Lascars	4 to 6	127½	1,530	2,682	2,682
		PELANDORAI ANICUT SYSTEM.					
		Water Regulation.					
1	1	Superintendent	30	30	360		
6	6	Lascars	4	24	288	648	648
		WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE NOT KEPT.					
		Water Regulation.					
23	23	Superintendents	5 to 35	383½	4,602		
3	3	Do. for four months	7	21	84		
193	193	Lascars	2 to 9	858½	10,302		
10	10	Do. for seven months	4½	45	315		
1	1	Do. for six "	3½	3½	21		
12	12	Do. for four "	5	60	240		
		Establishment for works in Malabar ...	...	...	222		
		Total ...	...	...	15,786		
		ADDITIONAL ESTABLISHMENT PROPOSED BUT NOT SANCTIONED.					
1	1	Superintendent	12	12	144		
		Total Water Regulation ...	...	...	15,930		
		NAVIGATION.					
3	3	Superintendents	7 to 14	31	372		
11	11	Lascars	4	44	528		
		Total Navigation ...	...	...	900	16,830	16,830

CHARGES.

PART IV—cont.

DETAIL OF THE BUDGET ESTIMATE OF ESTABLISHMENT OF THE IRRIGATION DEPARTMENT FOR THE YEAR 1880-81—*cont.*

Number.		Particulars.	Rate of Salary.	1880-81.			1879-80.
1879-80.	1880-81.			Per Mensem.	Per Annum.	Total.	
		AGRICULTURAL WORKS.	Rs.	Rs.	Rs.	Rs.	Rs.
2	2	Superintendents	7 to 15	22	264		
48	48	Lascars	2½ to 7	185	2,220		
4	4	Do. for six months	3½	14	84	2,568	2,568
		Temporary Survey Establishments to be sanctioned in detail as may be required.	...	...	...	11,000	11,000
		GENERAL.					
		OFFICE OF THE CHIEF ENGINEER FOR IRRIGATION.					
		Salaries—					
1	1	Chief Engineer, Second Class	2,303½	2,303½	27,642		
11	11	Clerks	25 to 140	610	7,320		
4	4	Draftsmen and Estimators	42½ to 60	205	2,460		
7	7	Office Servants	6 to 10	53	636		
					38,058		
		Travelling Allowance	...	...	2,871		
		Contingences	...	...	1,152		
		Do. for office furniture	...	...	300		
		ADDITIONAL ESTABLISHMENT PROPOSED BUT NOT SANCTIONED.			42,381		
1	1	Deputy Chief Engineer for Irrigation, Executive Engineer, First Grade.	1,340⅞	1,340⅞	16,091		
					58,472		
		Deduct portion charged to Productive Public Works.	...	...	19,619	38,853	38,249
		Share of Public Work Establishment debited to Irrigation at 25 per cent. on grant for works and repairs.	...	...	...	2,93,922	3,39,505
		Grand Total ...	...	...	...	3,67,217	4,12,196

PART VII.

ABSTRACT OF THE PROBABLE INCREASE OR DECREASE IN THE SUSPENSE ACCOUNTS OF IRRIGATION WORKS IN MADRAS PRESIDENCY FOR THE YEAR 1880-81.

None.

All suspense accounts are treated as Provincial.

APPENDIX A.

ACTUAL AND ESTIMATED CAPITAL ACCOUNT OF IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN THE MADRAS PRESIDENCY TO END OF THE YEAR 1880-81.

—	Direct Charges.	Indirect Charges.					Grand Total.
		Capitalisation of Abatement of Land Revenue.	Exchange on payments in England.	Leave and Pension Allowances.	Interest.	Total.	
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
CHEMBRAMBAKAM TANK.							
Old outlay	...	...	...	...	...	...	...
Outlay against current sanction.	5,62,330	...	...	...	...	...	...
Total actual outlay to end of 1878-79.	5,62,331	...	...	...	...	...	...
Probable outlay during 1879-80.	65,384	...	...	...	...	...	...
Proposed outlay during 1880-81.	...	...	...	...	...	...	...
Total ...	6,27,715	...	...	...	...	...	...
PELANDORAI ANICUT SYSTEM.							
Old outlay	...	...	...	...	...	...	...
Outlay against current sanction.	2,71,691	...	...	...	...	...	...
Total actual outlay to end of 1878-79.	2,71,691	...	...	...	...	...	...
Probable outlay during 1879-80.	524	...	...	...	...	...	...
Proposed outlay during 1880-81.	30,500	...	...	...	...	...	...
Total ...	3,01,715	...	...	...	...	...	...
PALAR ANICUT SYSTEM.							
Old outlay	12,57,922	...	...	...	...	...	...
Outlay against current sanction.	11,943	...	...	...	...	...	...
Total actual outlay to end of 1878-79.	12,69,865	...	...	...	...	...	...
Probable outlay during 1879-80.	8,360	...	...	...	...	...	...
Proposed outlay during 1880-81.	21,000	...	...	...	...	...	
Total ...	12,99,225	...	...	...	...	...	...
Grand Total ...	22,28,654	...	...	...	...	...	...

The Examiner of Public Works Accounts states that the information required to fill in columns 3 to 8 is not available.

APPENDIX B.

ACTUAL AND ESTIMATED REVENUE ACCOUNT OF IRRIGATION AND NAVIGATION AND AGRICULTURAL WORKS IN THE MADRAS PRESIDENCY TO END OF 1880-81.

—	Probable Receipts, 1880-81. Direct Receipts.	Share of Land Revenue.	Total.	Probable Expenses during 1880-81.	Balance, Surplus, or Deficit, 1880-81.	Probable Net Surplus or Deficit for 1879-80.	Actual Net Surplus or Deficit to end of 1878-79.	Probable Net Surplus or Deficit to end of 1880-81.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
IRRIGATION AND NAVIGATION.	*			†				
Works for which Capital and Revenue Accounts are kept.								
Chembrambakam Tank ...	20	...	...	8,000	...	...	...	...
Pelandorai Anicut System ...	50	...	...	8,500	...	...	...	...
Pálár Anicut System ...	550	...	...	29,500	...	...	...	...
Total ...	620	...	...	46,000	...	...	...	...

* Exclusive of the collections in Civil Department, no estimate having as yet been furnished.

† Exclusive of collection charges in Civil Department.

APPENDIX C.

ACTUAL AND ESTIMATED INTEREST ACCOUNT OF THE CANALS IN THE MADRAS PRESIDENCY TO END OF 1880-81.

—	Actual Charges for Interest to end of 1878-79.	Probable Charges for Interest for 1879-80.	Probable Charges for Interest for 1880-81.	Total to end of 1880-81.	Net Surplus or Deficit from Appendix B.	Balance of Interest Charges remaining unpaid to end of 1880-81.
1	2	3	4	5	6	7
IRRIGATION AND NAVIGATION.						
Chembrambakam Tank	...	26,776	28,247	...	...	...
Pelandorai Anicut System	...	12,238	12,936	...	...	...
Pálár Anicut System	...	57,332	57,993	...	...	...
Total ...	...	96,346	99,176	...	...	...

The Examiner of Public Works Accounts states that the information required to complete Appendices B and C is not available.

APPENDIX D.

…D ACCOUNT OF RECEIPTS AND CHARGES OF THE IRRIGATION BRANCH, PUBLIC WORKS DEPARTMENT, IN THE MADRAS PRESIDENCY FOR THE YEARS 1879-8…

RECEIPTS.

ACCOUNTS.	BUDGET ESTIMATE, 1880-81.	REGULAR ESTIMATE, 1879-80.
	Rs.	Rs.
…MMENCEMENT OF YEAR	...	...
…MENT—		
…ers	...	...
…ns to Service Funds	...	...
to General Family Pension Fund	...	...
to Hindu do.	...	...
…for land for Irrigation Works	...	...
… collection of water-rates	3,87,792	3,84,336
…om Forest Department	...	...
…xchange	...	...
…l Railways	...	...
…Miscellaneous, for interest charges	7,85,632	7,68,929
…PARTMENT—		
... ...	...	...
... ...	...	...
... ...	...	...
…EPARTMENT	...	...
… THE PUBLIC WORKS DEPARTMENT	25,17,000	27,97,252
…UNT—		
... ...	...	
…OUS	...	...
…L REVENUE RECEIPTS FROM PRODUCTIVE PUBLIC WORKS	*55,16,200	*54,51,100
DO. FROM WORKS OF IRRIGATION AND NAVIGATION...	†15,620	†15,195
DO. FROM AGRICULTURAL WORKS	...	...
…OUNTS—		
…rdinary Deposits	...	...
…ontribution Works	...	...
…lvances	...	...
GRAND TOTAL ...	92,22,244	94,16,862

* Including receipts realised in Civil Department.
† Exclusive of collections in the Civil Department, as the estimate has not yet been furnished.

CHARGES.

ACCOUNTS.	BUDGET ESTI… 1880-81.
	Rs.
BY CIVIL DEPARTMENT—	
Payments into Treasuries	...
Water-rate Collections	...
Miscellaneous Receipts of Public Works realised in Civil Department ...	53,86,0…
Expenditure against local Loans	...
Contributions in aid of Public Works	...
Guaranteed Railways	...
Transfers—Miscellaneous	...
Zemindari Embankments	...
BY MILITARY DEPARTMENT—	
Madras	...
Bombay	...
Bengal	...
BY TELEGRAPH DEPARTMENT	...
BY TRANSFERS OF THE PUBLIC WORKS DEPARTMENT	1,45,8…
(*b*) BY NET EXPENDITURE IN INDIA AGAINST IMPERIAL BUDGET GRANT UNDER CAPITAL PRODUCTIVE PUBLIC WORKS.	1,10,0…
(*b*) Do. do. do. UNDER ORDINARY PUBLIC WORKS	1,19,5…
(*b*) Do. do. do. UNDER ORDINARY PRODUCTIVE PUBLIC WORKS.	*10,44,7…
(*b*) Do. do. do. WORKS OF IRRIGATION AND NAVIGATION ...	†14,30,5…
(*b*) Do. do. do. AGRICULTURAL WORKS...	2,00,0…
Interest charges on Capital Outlay on Productive Public Works	7,85,6…
BY SUSPENSE ACCOUNTS—	
Deposits—Ordinary Deposits	...
(*c*) Do. Expenditure on works against contributions	...
(*d*) Tuccavee Advances	...
Total Charges ...	92,22,24…
By Balance at end of year	...
GRAND TOTAL ...	92,22,24…

* Including collection charges in Civil Department.
† Exclusive of collection charges in Civil Department.

(Signed) H. LEM. …
Offg. Examiner of Publi…

No. 48. ORDER THEREON, 26th December 1879, No. 745 I.

THE Budget Estimates for 1880-81 as drawn up by the Chief Engineer for Irrigation, and the distribution, by divisions, of the grants for Minor Original Works and Repairs shown in the Schedules B and C, are approved.

2. The Superintending Engineer of the Fifth Circle should expedite the submission of the revised estimate for the Srivaikuntham Anicut Project, and the Board of Revenue will be requested to furnish the Regular and Budget Estimates of Revenue for 1879-80 and 1880-81, respectively, without further delay.

3. Ordered that a copy of these Proceedings, with the abstract of receipts and charges and Part I of the budget, be forwarded to the Government of India in manuscript, and the remaining portions required as soon as they have been printed.

(True Extract.)

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

No. 49. (DOCKET No. 746 I., dated 26th December 1879.)

COPY forwarded to the Government of India.

(Signed) JOHN MULLINS, Colonel, R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

PUBLIC WORKS DEPARTMENT.

TABULAR STATEMENT OF MATTERS OF ROUTINE,

IRRIGATION,

FOR THE MONTH OF DECEMBER 1879.

GOVERNMENT OF MADRAS.

Back Numbers.	Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
1, 2	*Modification of allotments* proposed by the Superintending Engineer, Fifth Circle. Sanctioned.	3rd Dec. 1879, No. 707 I.	......
3, 4	*Do.* proposed by the Superintending Engineer, First Circle. Sanctioned.	3rd do. do. No. 708 I.	......
5, 6	*Proceedings of the Madras Government.*—Forwarding copies of certain — to the Government of India.	11th do. do. No. 718 I.	......
7, 8	*Channel from the Pennér river to the village of Peddapasupula, Cuddapah District.*—Proceedings, Board of Revenue, regarding the scheme of excavating a —, communicated to the Superintending Engineer, Second Circle.	11th do. do. No. 719 I.	12th Aug. 1878, No. 631 I, Mis. 10th Dec. 1878, No. 1,017 I, Mis.
9, 10	*Nirgantis or other Establishments for the distribution of water.*—Orders in the Revenue Department regarding the salaries paid in the Revenue Department to —, communicated to the officers concerned.	15th do. do. No. 725 I.	27th Nov. 1879, No. 705 I.
11, 12	*Monthly Appropriation Return.*—Orders on the — for October 1879.	18th do. do. No. 731 I.	......
13	The Accountant-General, Public Works Department, furnished with the above.	18th do. do. No. 732 I.	......
14, 15	*Madras Irrigation and Canal Company.*—Statement showing sums received and disbursed on account of the — for September 1879, communicated to the Chief Engineer for Irrigation.	18th do. do. No. 733 I.	......
16	The Home Government furnished with the above.	18th do. do. No. 734 I.	......
17	*Erratum* in G.O., No. 568 I., of 30th September 1879, communicated to the officers concerned.	19th do. do. No. 735 I.	......
18, 19	*Canal Plantation Report, North-Western Provinces*, for the year 1878-79. Recorded.	19th do. do. No. 736 I.	......

Back Numbers.	Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
20	*Re-appropriation of Budget Grants.*—Application made to the Government of India for certain —.	20th Dec. 1879, No. 738 I.	......
21, 22	*Srivaikuntham Anicut.*—Proceedings, Board of Revenue, submitting information regarding Irrigation and Revenue under —, communicated to the Examiner, Public Works Accounts.	24th do. do. No. 741 I.	22nd Oct. 1879, No. 633 I.
23, 24	*Tinnanúr Hissa Tank, Chingleput District.*—Orders in the Revenue Department regarding the incidence of expenditure on repairs to the —, communicated to the officers concerned for information.	29th do. do. No. 747 I.	31st July 1877, No. 36 I, Mis. 28th Mar. 1878, No. 274 I, Mis. 23rd Oct. 1878, No. 840 I, Mis. 6th Nov. 1879, No. 668 I, Mis.